

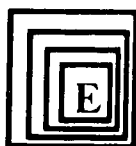
GHANA MIDAS II SEED MULTIPLICATION
PROJECT NO. AFR-0102-C-00-2003-00

END - OF - PROJECT REPORT

Prepared for:

AGENCY FOR INTERNATIONAL DEVELOPMENT

Washington D.C.



EXPERIENCE, INCORPORATED
MINNEAPOLIS, MINNESOTA 55402

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Ghana MIDAS II Seed Multiplication
and Extension/Demonstration Components

Project No. AFR-0102-C-00-2003-00

Kenneth E. Holt
Project Administrator
September 1986

I. BACKGROUND

A. 1961 - Initial Seed Multiplication Program

The seed multiplication element of the Ghana Seed Company (GSC) was created in 1961 as a Hybrid Maize Seed Production Unit dedicated to the production and distribution of maize seed. The production and distribution of improved seed has been generally recognized in Ghana as a national need; and during the past 25 years the Unit has not only survived economic and political changes within the country, but it has expanded the sphere of its operations to include all types of seeds.

B. 1972 - Enactment of Seed Law

In 1972 the Government of Ghana (GOG) enacted a Seed Law which empowered the Commissioner responsible for Agriculture to establish seed certification procedures and standards, and a National Seed Committee. The Seed Law had three primary objectives:

1. To eliminate the sale and distribution of inferior seed.
2. To increase national agricultural production through the use of improved seed.
3. To increase farmers' net income.

By 1972 it was evident that the demand for improved maize and rice seed was becoming greater than the production and distribution capabilities of the Seed Multiplication Unit (SMU).

C. 1973 - Mississippi State University Study

In 1973 Mississippi State University (MSU), under an AID contract, was asked to make an appraisal of the Seed Multiplication Unit's operations and to determine the potential of a joint venture, or some other type of working relationship with a United States seed company.

The Mississippi State team could find no United States seed company with an interest in producing and distributing seed in Ghana. In its report the MSU team stated: "It must be recognized that opportunities for private sector investment - and the private sector responds mainly to opportunities - seed production and supply in Ghana are very limited. Not only are transportation, communications, market intelligence, etc., poorly developed, but the major crop seeds in Ghana differ markedly in terms of potential commercialization." There have been no developments in the seeds situation in Ghana during the ensuing years that would alter the MSU team's appraisal of opportunities for private sector investment.

The MSU team recommended that "GOG give consideration to establishment of an autonomous, quasi-governmental corporation on the pattern of the National Seeds Corporations of India or Mexico with responsibility for seed production and supply in Ghana."

In its report the Mississippi State team listed a number of major constraints to the Unit's continued growth, many of which still remain unresolved by the GSC. They noted that the Unit had the responsibility for seed multiplication and production but not the reins of control and direction. To some extent the GSC has remained in this situation.

D. 1976 - Initiation of USAID MIDAS Program

In 1976 USAID initiated a comprehensive agricultural program in Ghana, "Managed Inputs and Delivery of Agricultural Services (MIDAS)," with six major components that included Seed Multiplication. The primary objectives were to: improve and expand the SMU's ability to produce foundation seed, utilize contract growers to produce certified seed, establish a seed certification program, process seed, and assist in establishing a comprehensive distribution program.

Four seed processing and conditioned storage centers were to be established and located at Winneba, Kumasi, Tamale, and Ho, to serve the entire country. Also, a Ghana Seed Inspection Service (GSIS), acting independently of the SMU, was to be established to insure seeds of high quality.

E. 1977 - Proposal to Form the Ghana Seed Company

In September 1977 "Proposals for the Formation of the Ghana Seed Company" were presented to the Ministry of Agriculture by J. Wobil, Officer-in-Charge, Seed Multiplication Unit. Quoting from the proposal:

"Ghana Seed Company is suggested as the name of the proposed Company. Although initially the company would have to rely entirely on government subvention and function like a Government corporation, the company tag is chosen because:

- a. It is proposed that as soon as practicable the government should encourage the private sector to absorb the industry.
- b. There is ample justification to expect that the industry should be able to stand on its feet in only a few years time. The industry is not expected to tap indefinitely on Government resources as is the case with several corporations in the country."

"The task ahead is enormous but the proposed company, operating along the lines proposed in this report and using as a guide the various reports prepared by American consultants and already accepted by the Government, will be able to meet the challenge, with the appropriate Government backing."

F. 1977 - Experience, Incorporated MIDAS I Technical Assistant Contract

In February 1977, Experience, Incorporated entered into a contract with USAID to provide technical assistance to the Ministry of Agriculture (MOA), Government of Ghana, to modernize and develop their seed industry.

The statement of work specified that: The contractor will collaborate with staff of the MOA to expand and improve the SMU to produce foundation seed, contract with private growers to produce certified seed, establish a seed certification program, process the seed, and assist in the establishment of a comprehensive seed distribution program.

Three technicians, on two year assignments, were to constitute the field team: a Management and Operations Specialist, a Seed Processing Specialist, and an Agricultural Engineering Consultant.

In May 1977 the Extension/Demonstration component of MIDAS was added to the Experience, Incorporated contract, and a Fertilizer Demonstration and Trials Specialist was added to the field team on a two year assignment.

G. 1979 - Ghana Seed Company Ltd. Organized

In August 1979 The Ghana Seed Company Ltd. was organized as a parastatal organization to be capitalized with 60 percent of the stock to be purchased by the Government, and 40 percent to be available for purchase by other investors. Currently, the Government of Ghana is the only stockholder. In chartering the Company, the Government set forth the following goals:

- o To acquire and take control of the operations, assets, and liabilities of the Seed Multiplication Unit of the Ministry of Agriculture.
- o To establish and manage farms for the production and sale of seeds and planting materials to meet the requirements of modern agriculture in Ghana.
- o To enter into contracts with state-owned organizations, as well as interested seed growing and producing concerns, for the sale and purchase of seed and planting materials.
- o To distribute seed on a nationwide basis with special emphasis on making seed available to small scale farmers and home gardeners.
- o To operate processing and conditioned storage plants to meet the increased seed needs of Ghana.
- o To carry on research for the development of new varieties of seed and planting materials.
- o To sell food and feed as a by-product of the seed industry.

Employees of the Seed Multiplication Unit were given the option to join the new company; 933 opted to do so. They were assigned to either the headquarters office in Accra, to one of the five area offices, or to one of the fourteen seed farms. The majority of the employees were farm workers.

H. 1979 - Experience, Incorporated MIDAS I Contract Amended

Upon the formation of the GSC, the USAID contract with Experience, Incorporated was amended and the Statement of Work revised to include the following:

"The Contractor will collaborate with the staff of the Ministry of Agriculture and its Seed Multiplication Unit (SMU) in implementing the transition of the SMU into the Ghana

Seed Company; expanding and improving the quality and quantity of foundation and certified seed; contracting with private growers to produce certified seed; establishing a seed certification program; processing and distributing seed; and establishing a comprehensive seeds industry."

The amendment added a "GSC Co-Managing Director" to the Experience, Incorporated field team on a two year assignment. The title of Co-Managing Director was not acceptable to GSC management and the incumbent was given the title of "Technical Director" although the duties and responsibilities remained essentially the same. The amendment also extended the length of the assignments of the other team members.

I. 1980 - MIDAS II Agreement Signed

In August 1980 a Project Grant and Loan Agreement for MIDAS II was signed by the Government of Ghana and USAID. Among other things, USAID agreed to provide:

Under Grant Funding:

- o The services of three United States technicians, one in seed production management operations, one seed processing engineer and seed testing and certification technologist, and one general co-manager of the Ghana Seed Company (one of the aforementioned technicians to also assist the GSIS).
- o Housing and utilities, and maintenance and petrol for the AID funded vehicles utilized by the U. S. technicians.
- o Participant training.
- o Farm machinery such as tractors, plows, cultivators, planters, harrows, discs.

Under the Loan:

Seed processing, drying and storage center equipment such as materials and supplies, dryers, cleaners, elevators, conveyors, shellers, scales, bins; electrical system materials; raw materials for bags; seed and soil test equipment; utility vehicles, forklifts; shop equipment and maintenance tools; office equipment, airconditioners, radio/communications, sales promotion supplies; pesticides and insecticides.

No building materials were included; these became a major constraint in completing the construction of the seed drying, processing, and storage facilities.

J. 1982 - Experience, Incorporated MIDAS II
Technical Services Contract

A decision was rendered by AID Washington that the technical services for MIDAS II must go through the bidding process as a new contract. Due to time constraints in carrying out the bidding process the Experience, Incorporated contract on MIDAS I extended to December 31, 1981.

Experience, Incorporated was the successful bidder and a three year contract was signed to provide technical services to the GSC under the MIDAS II Agreement. Although the Grant agreement specified that one of the technicians would serve as a "general co-manager" of the Ghana Seed Company, this position was not included in AID's request for proposal. Had this position been included it is likely that some of the problems that have recently surfaced in the GSC management would have been averted, or at least tempered.

The Agricultural Mechanic Specialist position was added in 1983, and the Management Accountant position was added in 1984. There were continued delays both in amending the Experience, Incorporated contract to include these two positions, and in obtaining necessary approvals of the candidates. The Agricultural Mechanic arrived in Ghana in February 1984; the Management Accountant in March 1985. Both positions should have been included in the 1982 technical service contract.

Due to circumstances not within the control of either the GSC or Experience, Incorporated, procurement of essential equipment for completing the seed processing plants, and much needed transport and farm equipment were delayed. This necessitated the extension of the Experience, Incorporated contract to September 30, 1986.

This report includes the end-of-tour reports of each team member of the MIDAS II contract and this summary report by the Experience, Incorporated Project Administrator.

II. SEED MULTIPLICATION PROJECT TEAM

Technical Coordinator and Seed Processing Advisor, (Chief of Party).

- o Mr. Orris H. Shulstad, Experience, Incorporated--January 1982 - March 1986.
(Served in the same position on the Experience, Incorporated Midas II contract.)
- o Counterparts - Fredrick Hammond, GSC Processing Manager; as Chief of Party Mr. Shulstad also worked closely with Mr. Josiah Wobil, GSC Managing Director.

Seed Production/Management Specialist.

- o Sheldon Sandager, Experience, Incorporated--February 1982 - March 1986.
- o Counterpart - Peter K. Poku, GSC Production Technical Coordinator.

Seed Quality Control and Certification Technologist.

- o Dr. William Hall, Experience, Incorporated--February 1982 - September 1984; Dr. Hall returned to Ghana on a short-term assignment, to consult with the GSIU, in January-February 1986.
- o Counterparts - Mr. A. A. Amihere, Quality Control Manager, GSC and Mr. J. R. Turkson, Officer in Charge, Ghana Seed Inspection Unit.

Agricultural Mechanic Specialist.

- o Mr. David Johnson, Experience, Incorporated--February 1984 - March 1986.
- o Counterpart - Mr. Ebenezer Odel Addo, Assistant Engineer, GSC.

Management Accountant Specialist.

- o Mr. Guy C. Hill, Experience, Incorporated--March 1985 - March 1986.
- o Counterpart - Mr. E. Andoh, Accountant, GSC.

Extension/Demonstration Specialist.

- o Mr. Kenneth Haines, Experience, Incorporated--January 1982 - August 1982; (this was a carryover on Mr. Haines' assignment from the Experience, Incorporated MIDAS I contract).
- o Counterpart - Mr. J. K. Tawiah - Regional Agricultural Officer.

Seed Processing Advisor (Short-Term).

- o Dr. Paul R. Mezynski, Experience, Incorporated--August 1985 - October 1985.

Project Administration.

- o Mr. Duane Eriksmoen, Experience, Incorporated Home Office--January 1982 - July 1983; this was a carryover from the Experience, Incorporated MIDAS I contract administration.
- o Mr. Kenneth E. Holt, Chairman, Experience, Incorporated --July 1983- September 1986.
- o Mr. Josiah Wobil, Managing Director, GSC.

III. SEED PRODUCTION

The production of improved seeds through the multiplication of breeders and foundation seed stocks was the primary objective in the initiation of the Seed Multiplication Unit over 25 years ago and still remains as a primary function of the Ghana Seed Company. Seed multiplication is the one area of the company's operation in which the majority of management personnel have some understanding and competence. It also employs the vast majority of the company's personnel; therefore, it has received more management attention than its importance in the company structure justifies.

Mr. Sheldon Sandager of Experience, Incorporated served the Seed Production Management Specialist to the GSC for four years (February 1982 to December 1985). During this period, he made frequent visits to all of the foundation seed farms and also visited and consulted with approximately 200 certified seed contract growers, travelling an estimated 120,000 miles. His accomplishments, comments, and recommendations are given in his end-of-tour report, a section of this report.

Mr. Peter K. Poku, the GSC Production Technical Coordinator, was assigned as Mr. Sandager's counterpart. Mr. Poku assisted with overall farm planning and in training both farm managers and support staff on the foundation seed farms. To conserve funds the Managing Director redeployed all Divisional Managers as Coordinators in August 1984; this change in responsibilities confined most of Mr. Poku's activities to the Accra office. With Mr. Sandager's departure, GSC management in Accra has lost direct contact with the seed farms and contract growers.

A. Foundation Seed Farms.

When the Ghana Seed Company was established it inherited the fourteen (14) foundation seed farms that were being operated by the Seed Multiplication Unit. The Project Grant and Loan Agreement, signed in 1980, states that four foundation seed farms will be operated to multiply breeders seed. This statement shows an intent to reduce the company operated farms to a more efficient and cost effective number; however, this has not been accomplished, and in 1985 the company conducted seed multiplication operations on 12 farms.

Mr. Sandager has developed a more intimate knowledge of the GSC foundation seed farms and their operations than anyone in Ghana. He also has the background and experience to render a judgment on each farm's performance and its 'potential contribution to the GSC seed production program.

In his opinion, the consolidation into fewer and larger units will:

- o Permit better equipment and support facilities at a lower unit cost of production.
- o Increase productive time of both labor and management.
- o Reduce transport requirements and costs.

Mr. Sandager was requested to recommend a "restructuring of the GSC foundation seed farms." Briefly it is as follows:

- o Rice is currently produced on three farms with full complement of machinery and personnel at each farm. Current requirements for foundation seed could be produced on the two farms in the Tamale area (Nabogo and Salega) either of which can be readily enlarged to meet future needs.
- o The Nabogo farm is near enough to Bolgatanga to supply the foundation seed needs of contract growers in that area. The Gbedemilisi farm now serving Bolgatanga should be abandoned.
- o Foundation maize seed required for the northern and upper regions can be transported from the southern plants at less cost than maintaining the Damango and/or the Nyankpala farms. Both farms should be abandoned.
- o Based on foundation seed requirements in the Kumasi area for the past five years, the Kwadaso farm near the GSC Kumasi plant can supply the demand. The lack of productivity of the Ejura farm and high transport costs to Kumasi justify its abandonment. If there is a need for increased production in the future, a new location in the Mampong area, within 30 miles of the Kumasi plant, is recommended.
- o The foundation seed requirements for the Winneba area can be met with the production from the Okyerko farm located near the new Winneba processing plant. The newly cleared land adjacent to the plant site can augment foundation seed production and be used for isolation requirements and demonstration plots.
- o The Logba and Asikuma farms in the Ho area both have shortcomings and their consolidation in a better location should be given careful consideration. The Peki Settlement is suggested. Sufficient land is available and all support facilities are there including a crop dryer and workshop.

If these recommendations are implemented the foundation seed production operations would be consolidated into five farms, two for rice and three for maize. The multiplication of other crops would be conducted at the farm best adapted to its cultural requirements. The cost savings due to reduction in facilities, equipment, inventories, management, and labor would be substantial.

B. Multi-Contract Grower Situation

In the MIDAS I phase of the project the contract growers were supplied with foundation seed, fertilizer and pesticides on credit as incentives to become contract growers for the GSC. These were to be paid in-kind when their seed was delivered to the Company. Under the MIDAS II phase the GSC revised its policy to supply only the foundation seed on credit with the grower supplying all of the other production inputs.

There is no firm contract between the grower and the GSC stating the volume of "certified seed" the grower is to produce, or any guarantee that the GSC will purchase the seed when harvested; also, no price is established for the seed until harvest time. Generally, the growers produce more "certified seed" than the company needs, and the price the company pays for the seed is negotiated at harvest time. Both the official and unofficial market prices for maize and rice have an impact in these price negotiations. Both the prices paid to the growers and the retail price of the seed sold to the farmer is subject to MOA approval.

The GSC uses approximately 200 contract growers to produce maize, rice, groundnut, and cowpea seed. The performance of the GSC contract growers is commendable considering the macroeconomic and political factors they have experienced during the past four years over which they had no control. In addition, the growers in some areas had three successive years of drought.

In 1984 the rains in Ghana returned to normal, resulting in a bumper harvest; however, the surplus quantities of donor grains resulted in depressed market prices and some farmers left their crop in the fields to rot as the cost of harvest and transport exceeded its value at the marketplace.

Contract growers that delivered seed to the GSC in 1984 were given partial payment with promise of full payment when the seed was sold. Due to poor seed sales the GSC was unable to complete these payments to some of the growers. Many seed growers who did not receive full payment displayed sustained support and confidence in the Company by delivering most of their 1985 quota of seed to the Company on credit.

The Ghanaian farming community is faced with grave liquidity problems as a result of successive years of poor harvest and the farmers' inability to repay loans granted them on the basis of the 1984 bumper crop. In addition the equipment on most of the farms is old and in disrepair. Repair parts are difficult to obtain and if available the costs are excessive. At current prices very few farmers can justify or afford to purchase new equipment. This situation in the farming sector combined with the GSC dependence on contract growers for seed supplies, poses a serious problem for the GSC.

C. Alternative to Multi-Contract Growers

In developing nations, such as Ghana, the "multiple contract grower concept" is questionable. It is extremely difficult and often costly to implement because of the fast developing and unpredictable economic and political changes that occur. The infrastructure in these countries is generally not sufficiently developed to support a widespread, complex, vertically-integrated operation like the GSC contract grower program.

Also, the volume and rate of delivery of "certified seed" to the processing plant by the growers must be compatible with the plant size and storage capacity to accomodate the conditioning of the seed within the relatively short harvest period. To be cost effective, the processing plant must run continuously during harvest. This requires judicious scheduling of seed delivery to the plant by the contract growers, who have little or no transport capability. This is not possible under the present agreement with the growers; the growers decide when they will deliver the seed, not the GSC.

An alternative to the multigrower concept is contracts with one or more large, well-established commercial operations, strategically located in maize producing areas, who would be capable of delivering a specified volume of seed at a price established by a predetermined formula. The GSC would have control of seed delivery to the plant. The SCOA farm located in Kesewa is one example of an ideally located operation for serving the Winneba plant needs. Similiar large scale farming operations can be found to produce certified seed for the other processing plants operated by the GSC.

This alternative to the multi-grower program would:

- o Eliminate the uncertainties in dealing with a large number of growers.
- o Assure adequate supplies at a price established by a predetermined formula rather than negotiations at harvest time.

- o Greatly reduce the multiple logistical problems in field inspection and quality control.
- o Minimize or eliminate the problem of transporting the seed from the grower to the plant at harvest time.
- o Enable the GSC to coordinate seed harvest with the capacity of the processing centers.

Eliminating unproductive units and practices is a major step in cost reduction. Consolidation of the foundation seed farms and abandonment of the multi-grower concept for contracting the production of certified seed will lessen growers' dependence on GSC for inputs; also, other cost burdensome services, especially transport, would be substantially reduced. Abandoning the small growers may be unpopular and meet with resistance within the GSC, in the areas where foundation and contract farms are located, and possibly with some of the contract growers. However, the financial situation of the GSC is such that management must take some drastic steps to reduce costs of seed that is produced or aquired.

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IV. FINANCIAL MANAGEMENT AND ACCOUNTING

The position of Financial Controller was envisioned and duties described in the GSC management organization set forth in the "Proposals for the Formation of the Ghana Seed Company," issued in 1977:

"His duties will be to oversee the financial affairs of the company. He has to be of high-calibre in view of the rather heavy capital that will be operated by the company. He will have under him a Chief Accountant and an Internal Auditor and a Purchasing and Stores officer."

When the Company was organized in 1979 a chief accountant was employed by the GSC. An internal auditor was added to the staff in 1983. The Managing Director assumed the responsibilities of the financial controller and that position was not filled.

A. MIDAS I - Technical Director

As previously stated, Experience, Incorporated's initial contract was amended to include a two year assignment for a Co-Managing Director on its Ghana field team. Mr. John Sutherland, a former seed company executive, was selected to fill the position. On arrival in Ghana he was given the title of Technical Director. The Acting Managing Director, Mr. J. Wobil, was designated as his counterpart. Mr. Sutherland's primary assignment was to work with and train the then Acting Managing Director.

Mr. Sutherland's assignment was completed in June 1981. The MIDAS II follow-on contract with Experience, Incorporated concentrated on the technical aspects of the company's operations and did not include a counterpart to the Managing Director. Although Mr. Sutherland was not on the MIDAS II team, his end of tour comments and recommendations are cogent to the current GSC situation and are included in this report.

B. Management Accountant

The 1984 Project Evaluation Team noted that many of the company's problems were attributable to an inadequate and poorly managed accounting system. The Evaluation Team recommended that a Management Accountant be added to Experience, Incorporated's field team on a one year assignment. Unfortunately a year elapsed before the Experience, Incorporated contract was amended to include the position and to obtain approvals on the nominee, Mr. Guy Hill.

Mr. Hill arrived in Ghana in March 1985 and, as the initial phase of his assignment, conducted an in-depth study of the entire GSC organization to determine weaknesses and to establish procedures for correcting them. This required investigating Company policies, systems, procedures, and internal controls. A report of his findings "A Study of the Problems of the Ghana Seed Company and Recommendations on Cost Ascertainment and Cost Control" was issued in September 1985. The report revealed glaring weaknesses in the Company's accounting and marketing operations. On receiving the report the GSC Management took a defensive stance thereby negating the opportunity to begin taking corrective actions on the weaknesses that were revealed. A financial audit of the GSC accounts was conducted later by Price Waterhouse, under a USAID work order. Their findings and report corroborated those of Mr. Hill.

In the second phase of his assignment Mr. Hill devised accounting systems applicable to the GSC operations and prepared an Accounting Manual which was issued in February 1986. Mr. Hill's assignment ended in March; thus, there was insufficient time to properly introduce the systems and train the accountants. He has recommended that an accounting consultant be retained by the GSC for 18 to 24 months to implement the accounting system and train GSC management on the use of information generated by accounting for planning and operating decisions.

C. Cost Ascertainment and Control

Mr. Hill's end of tour report, included herein, capsulizes his findings and recommendations. Copies of the report "A Study of the Problems of the Ghana Seed Company and Recommendations on cost Ascertainment and Cost Control" and the "Accounting Manual" are in the USAID Ghana Office and the GSC Office in Accra. Some of the items on which the GSC should take immediate corrective action are described below.

- o The stores system does not form a part of the financial accounting system. No values are attached to the individual items in stores and as a result issues and receipts are not recorded with monetary values.
- o Fixed Asset inventories revealed a total lack of control over movements and thus over the assets themselves. Assets were transferred, loaned to other parties, or scrapped without advice to the Accounting Department.
- o The lack of physical and monetary control over the stores is a major weakness of the GSC and requires senior management's urgent attention in the immediate future. Staff members who frustrate instituting and maintaining this control must be removed.

- o Seed inventories present a different problem than fixed assets. Inventories in sales kiosks are considered "sold" and ignored. On processed seed there is no effort to relate gross input to output of seed. Seed spillage is considered to have no value and is ignored. Spot checks at the Winneba Plant showed a lack of control of stock moving out of the premises. There was no gate check for movement authority nor examination of loads.
- o Investigation of accounting returns relating to sales showed that accounting forms did not reconcile opening seed inventories, receipts, and issues to closing inventory balances; nor were the issues (or sales) of seed inventory reconciled to cash deposited. Discrepancies between cash sales and cash deposits were found at two area offices.

D. GSC Accounting Management and Staff

Major changes must be made in the Head Office Accounting Department. The Chief Accountant has neither the experience, leadership ability, nor the professional qualifications necessary to head up the department. He should be replaced by a person with the needed professional and leadership qualifications to assume the position of Controller (Finance and Administration). The urgency of this replacement cannot be overstressed.

There has been a move by GSC management to upgrade the accounting staff since the September 1985 report was issued. The accounting skills are relatively strong in the Tamale and Bolgatanga area, new accountants have been appointed to the Winneba and Kumasi areas, and the junior staff in Accra can be trained to handle the recommended accounting procedures.

Guidance, leadership, training, which has been totally absent in the GSC Accounting Department, must be added immediately. Without strong leadership to effect the needed changes the accounting function can become a serious liability to the company due to the misinformation and/or lack of information it generates for management decision making.

There has been a complete lack of performance on the part of the Internal Auditor. No attempt to verify the assets of the company has ever been made, nor has he investigated or commented on the discrepancies in seed inventories, seed losses at plants and warehouses, or cash discrepancies. It is recommended that the Internal Auditor be replaced immediately with a professionally qualified auditor to head up the Internal Auditing Department.

The GSC accounting department collects and dispenses historical information on the company's transactions and financial position. Very little information is generated and issued that is of value to management in its decision making.

E. Accounting Manual

The Accounting System and Manual designed by Mr. Hill for the GSC features "Management Accounting" with the primary emphasis placed on planning and control. Management accounting is concerned with the accumulation and interpretation of information that assists individual managers at all levels to fulfill their organizational responsibilities. To accomplish this objective the decentralization of accounting operations to area levels with strong leadership in the headquarters office is essential.

V. MARKETING AND SALES

The functions and importance of "Marketing" have not been fully understood by GSC management. In the 1977 "Proposals for the Formation of the Ghana Seed Company" the responsibilities of the Sales Manager were described as: warehousing, order taking, distribution, collection, promotion, and record keeping. The Seed Multiplication Unit was an agency of the Government and looked upon as a "national need" by the GOG, USAID, and others. Supply seldom met the demand for improved seeds, the seed was subsidized to the farmer, there was no accounting of production and distribution costs, and no motive existed for SMU management at any level to cover the costs of their operations. With background it is understandable that the GSC management did not understand the need to develop a marketing function.

A. GSC Seed Marketing Situation

The objective of the formation of the GSC was to expand the use of improved seeds with expectations of supplying 25 percent of the maize and rice seed market annually. Facilities were planned to produce and distribute the quantities of maize and rice seed to meet this goal. It is now recognized that this is not a realistic goal for the foreseeable future, and facility development has been reduced to a more practical level.

With the formation of the GSC the Government subsidies on seeds were discontinued and the farmer is now asked to pay a higher price for the GSC Seed than he can get for his own "seed" in the market. Many farmers recognized the value of the improved seed and continued to be GSC customers as long as they considered the price reasonable. But, the GSC is now faced with the task of convincing large numbers of farmers on the value of using improved seeds at a price considerably above commodity market prices.

An extensive network of sales kiosks for distribution of the seeds was planned and many have been established; but the GSC does not have the funds and personnel to properly demonstrate and promote the value of their improved seeds to the local farmers. The MOA Extension Division should be the logical organization to perform this service and it has been suggested that the GSC enlist its assistance. However, Mr. Haines, the Extension/Demonstration Specialist, notes in his report that the extension services lack funds, inputs, and trained personnel.

B. Market Intelligence

An important function of marketing that is essential to company management is market intelligence which includes: acreages under crops, prices and trends for main staples in supply channels, and crop forecasts. The collection and analysis of this information can provide the GSC with a basis for projecting future seed demands and prices.

A primary cause of the current financial situation of the GSC was a speculative build-up of seed inventories starting in 1983, with a purchase price of certified seed grossly in excess of the consumer prices. There had been no market intelligence to warn GSC management of threatened changes in demand. The company had adopted its stance on a sellers market when indeed a perceptible shift to a buyers market had taken place. Thus, with a glut of maize in the market, consumer prices fell and the company was faced with an overstock of high priced seed and seed deterioration.

VI. SEED PROCESSING

A very visable weakness in the operations of the Seed Multiplication Unit as a part of the MOA was its seed processing equipment and capabilities. In promoting the transition of the SMU into a parastatal the attention was focused on the physical aspects of seed production and processing almost to the exclusion of management, accounting, and marketing. There was definitely a national need to increase the quantities of improved seeds and to make them available to Ghanian farmers at an affordable price. However, the equipment available to process (condition) and store improved seed under controlled conditions was far below the perceived national requirements and viewed by most observers as a major constraint.

As a parastatal, it was intended that the Ghana Seed Company would raise capital funds and generate the income needed to procure equipment and construct facilities for producing, processing and storing the country's seed requirements. The initial projections for seed processing facilities in Ghana were made by a Mississippi State University team based on projected seed demands. New processing plants were to be built at four locations: Winneba, Kumasi, Tamale, and Ho.

The MOA and USAID agreed that the Winneba plant construction should start first and construction on the Kumasi plant should begin six months later. By February 1978 Mr. Shulstad, the Technical Coordinator and Seed Processing Engineer, had prepared the equipment specifications for two seed plants, seed testing laboratories, shop tools and equipment. Due to the high cost and shortage of petroleum products it was decided that the electricity, which is readily available in Ghana at a reasonable price, would be used at the plants for drying the seed. USAID PIO/C procurement was made through AAPC and most of the equipment had arrived and cleared through the ports by March 1981.

A. Winneba Seed Processing and Storage Facility

The Winneba seed plant has a rated capacity for seed storage, under controlled conditions, of 25,000 maxi-bags (200 pounds). One-fifth of this capacity is programmed for carryover stocks to ensure against crop failures. The seed drying and processing are compatibly rated in hourly capacity with annual targeted seed goals attainable in 60 days of operation. It is estimated that the contract seed production needed to supply the plant can be generated within a 25 mile radius.

Award of construction for starting Winneba was made in July 1980. From the outset, construction was very slow. There is no warehousing available in Winneba, and the seed plant equipment and dryers for the new plants had to be stored in the open. As of January 1982 no structures had been completed at Winneba, and by the end of 1982, only 20 percent of the first phase construction at Winneba, had been completed while the new equipment continued to be exposed to the weather.

Construction of the Winneba plant faced a series of problems and delays. It was originally intended that the plant would be ready to receive seed from the 1982 harvest; but, the first seed was not processed through the column dryer until the 1985 harvest. Major constraints that contributed to these delays included:

- o The lack of building materials in Ghana, particularly cement and reinforcing rods.
- o The GOG's lack of funds to pay contractors.
- o A fire in 1983 that destroyed most of the refrigeration equipment that was in storage.
- o A United States moratorium on procurement of equipment and supplies from April 1983 to July 1984.
- o Delays in processing orders for needed electrical supplies.

Although the workshop, storage facility, and other units at Winneba are still not fully complete, the perseverance of Mr. Shulstad was substantially responsible for the plant being operable for the 1985 harvest.

B. Kumasi Seed Processing and Storage Facility

Ground breaking ceremonies for the Kumasi plant took place in October 1981. However, the contractor who bid the works delayed start-up, awaiting GOG guarantees of materials. Meanwhile, USAID, after further study of the Kumasi situation, decided not to support the Kumasi, even though all of the equipment for the plant had arrived in Ghana.

The primary reason for AID abandoning Kumasi as a site for a new maize processing facility similar to Winneba was its distance from contract growers (35 to 90 miles) over bad roads. The seed processing equipment procured for Kumasi was transferred to Tamale for installation. The column dryer scheduled for Kumasi remains in Winneba. It should be installed in Winneba to dry commercial grain production for growers, or it should be sold.

A fire at the Kumasi plant in 1983 destroyed most of the seed processing and storage building and equipment. The items that were destroyed were programmed for replacement under the loan funded procurement program to enable the GSC to provide seed to this major maize production area.

C. Completion and Maintenance of Seed Facilities

Mr. Shulstad has prepared a detailed list of the items that must be completed at the Winneba, Kumasi, and Tamale plant sites to bring them into compliance with the approved plans and make them fully operable. His report is included here-in.

In their reports both Mr. Shulstad and Dr. Mezynski emphasized the need for the GSC to implement a maintenance and repair program in each of the plants. The equipment is designed to give many years of service and will do so if properly maintained. Mr. Hammond, who was trained as Mr. Shulstad's counterpart for six years, has left the GSC. It is incumbent on the GSC to immediately find a replacement for Mr. Hammond who has the technical qualifications to supervise the maintenance and repair programs for GSC seed processing operations. Maintenance and repair of some of the equipment, such as the column dryer and refrigeration units, should be placed on contracts to companies which have this expertise.

D. Protection of Facilities

Two major fires at seed processing facilities together with several thefts of equipment emphasize the need for improving guard services and fire detection and controls at these plants. Plant facilities and equipment represent major company assets and it is unlikely the company can get funding for replacement if they are destroyed.

E. Training in Operation and Maintenance of Seed Processing Plants

Mr. Shulstad is an experienced Technician in all facets of seed drying, conditioning, and storage. Throughout his tour of duty he advised and trained the seed plant managers and operators in the functions and use of the GSC processing equipment to insure the production of clean, viable seed. Mr. Shulstad had many project duties and commitments that would not permit his spending full time on the start-up of the new Winneba plant. Therefore, it was decided that a qualified seed processing engineer would be added on a short term assignment.

Dr. Paul Mezynski was added to the Experience, Incorporated team for three months, August through October 1985, to oversee the start-up of the Winneba processing plant and storage facilities, to make needed changes and adjustments to insure proper seed drying and cleaning, and to train plant operators.

As usually occurs on a new plant start-up several minor changes and adjustments were required. The plant performed to expectation; but, due to the economic situations of the GSC, the volume of seed carry over, and contract growers holding their seed in expectation of price increases, a very low volume of seed was processed in 1985. The capability of the plant and operators to process seed through the plant at its rated capacity was not really tested.

Dr. Mezynski prepared a manual for the plant operators to:

- o Assist the operators in becoming familiar with the parts and functions of a commercial size air screen seed cleaner.
- o Instruct them in the operation and adjustment of the seed cleaner.
- o Insure that the operator trainees can continue to operate the plant in an acceptable manner.

VII. SEED QUALITY ASSURANCE, TESTING AND INSPECTION

Dr. William Hall joined the Experience, Incorporated Field Team in February 1982 to advise and assist in the development of seed quality assurance programs for both the Government of Ghana and the Ghana Seed Company.

Assist the Officer-in-Charge of the Ghana Seed Inspection Service (GSIS) to:

- o Establish a functional seed certification agency.
- o Inspect fields and seed producing facilities.
- o Test for quality and issue labels for seed which meets the seed laws and standards of Ghana.

Assist the Quality Control Division of the Ghana Seed Company to:

- o Establish seed testing laboratories in Accra and at each processing plant.
- o Develop a system for monitoring quality of the seed product at each stage of production.
- o Train supervisors and technicians in all facets on seed testing and quality control.

A. Ghana Seed Inspection Service

With the withdrawal of the Seed Multiplication Unit from the MOA to form the Ghana Seed Company a number of changes were required in the Legislative Instrument (L.I.) 802 for the Ghana Seed Inspection Service and National Seed Committee to begin functioning.

Dr. Hall and Mr. Turkson, Officer in Charge GSIS, prepared and submitted a proposed amendment to L.I. 802 to the Attorney General's office in October 1982. An amended version was returned in September 1983, with the name changed to Ghana Seed Inspection Unit (GSIU) to conform with Ghana's structuring of agencies. This was forwarded to the GOG for the signature of the P.N.D.C. There had been no response prior to Dr. Hall's departure in September 1984.

Dr. Hall consulted with and provided training to Mr. Turkson on the GSIU services and responsibilities; however, lacking legal status, the GSIU could not establish a testing laboratory, an inspection unit, or hire staff. The laboratory equipment that had been purchased for the GSIS was distributed by AID to the GSC area seed laboratories.

The L.I. 802, Seeds Regulations, amended in 1983 was formally approved in 1985, and in January-February 1986 Dr. Hall was requested to return to Ghana to assist the MOA in designing the framework for a basic GSIU organization and operation. The request was to keep the structure, functions, and responsibilities at a minimal level in the initial stages of the Unit's development. An organizational chart, budget, and list of laboratory equipment and supplies was prepared and submitted to the MOA and USAID. A copy of Dr. Hall's report is included herein.

B. National Seed Committee

The National Seed Committee was established and its functions described in L.I. 802. The Committee is composed of high level representatives from various organizations involved in Agriculture and will serve as an advisory body to the GSIU.

C. Ghana Seed Company Quality Control

The responsibility for assuring the consumer that the seed it sells meets established specifications lies with the GSC. To meet this responsibility the GSC, with the assistance of Dr. Hall, established a primary seed testing laboratory in Accra with satellite laboratories at Ho, Winneba, Kumasi, Tamale, and Bolgatanga.

An initial three week training course was conducted by Dr. Hall for all of the seed quality control technicians; this was supplemented by visits to the area laboratories and by periodic refresher courses for the technicians. In addition, four GSC trainees were sent to Mississippi State University for specialized training in seed conditioning and quality testing.

Field inspection forms were developed, and prior to the harvests in 1982, 1983, and 1984, field trips were made to each of the seed producing areas where field inspection training was given to the GSC quality control and seed production personnel. The GSC Quality Control Personnel have been adequately trained to perform needed field inspections until the GSIU is established and operating. These well trained and experienced technicians are an asset to the company.

VIII. MECHANIZATION

A. Mechanization Section

The Ghana Seed Multiplication Project followed the pattern that has been characteristic of most AID sponsored, large scale, agricultural projects; that is, no provisions were made for maintenance, repair, and operator training of the rather sophisticated equipment that was procured with AID funds.

During the period 1977-1983 vehicles, tractors, farm implements, shop equipment, tools, and some spare parts were purchased by USAID and delivered to the Ghana Seed Company. The accountability for this equipment and the responsibility for its use and care was not assigned to any single individual within the GSC organization. Although it was not within the scope of his assignment Mr. Sandager, the Experience, Incorporated Production Management Specialist, spent much of his time training operators and mechanics, and keeping the farm machinery operating.

In 1983 the Experience, Incorporated contract was ammended to include an Agricultural Mechanic Specialist; but, due to the freeze in AID funded support of the project, it was February 1984 before the Specialist, Mr. David Johnson, arrived in Ghana. His efforts to create a Mechanization Section with responsibility and control over the Company's vehicles, equipment, drivers, operators, and mechanics met with very little success; however, there is now a greater recognition within the GSC of the importance of this function to the success of the company's operations.

The mechanization section should be given greater control over the GSC vehicles, equipment, drivers, operators, and mechanics. Each of the area workshops should be supervised by a qualified, educated mechanic who can read and interpret equipment service and repair manuals.

B. Equipment

During the period 1977-1983 there were 35 over-the-road vehicles, 11 tractors, and 37 major pieces of farming equipment procured with AID funds and delivered to the GSC. In addition shop equipment, tools, and a sizeable quantity of spare parts were supplied for the maintenance and repair of this equipment.

The GSC had no workshops in which to set up the shop equipment, no covered area under which repairs could be made, and very few literate mechanics who could read and interpret the instruction manuals. As a result many vehicles and farm equipment units were out of service when Mr. Johnson arrived.

Both Mr. Johnson and Mr. Sandager spent a great deal of their time in the actual repair, and in some cases the rebuilding, of GSC equipment. When these men departed the project, 24 of the 36 over-the-road vehicles were in service, 5 were being repaired, 5 were being cannibalized for repair parts, and 2 had been sold. Eight of the 11 tractors were in service with the other 3 being repaired. All of the 37 pieces of farm machinery were in service.

Five 60 Hp tractors together with 34 pieces of farming machinery were received in 1978-1979. In 1982 five 90 Hp tractors were received but the matching equipment for these tractors was never ordered. The majority of the GSC equipment is seven years old, the newest is four years old. Much of the equipment is reaching the point where replacement of some items is becoming critical. No program for funding and on-going procurement of spare parts has been established. This will become a serious problem for the GSC.

Although most of the vehicles, tractors, and farm equipment supplied by AID are still in service, many units have reached an age where either major repairs or replacement will be required if the GSC is to continue seed production on its farms. A list of new equipment needed has been prepared by the Production Management Specialist. This situation must be considered and addressed by AID and the GOG in any restructuring of the GSC.

C. Workshops

Plans were to establish a good central workshop in Accra with regional workshops at Winneba, Kamasi, and Tamale. Other areas and farms were to be provided with tools and equipment to enable them to do servicing, preventive maintenance, and routine repairs.

Shop equipment and tools were purchased for the Company with the intention that new workshops would be constructed at Accra and Winneba. Unfortunately, these workshops were assigned a low priority in the GSC construction schedule, and as a result no workshops were completed by the time the Experience, Incorporated team departed Ghana. Some of the shop equipment was installed in the seed processing building at Winneba for use in repairing the drying, processing, and refrigeration equipment.

Workshop buildings have been started at Winneba and Accra. At Accra the foundation, floor, and some walls are completed; at Winneba there is only the foundation. There is no scheduled completion date on either workshop.

Lists of equipment and tools for improving the workshops at Tamale and Kumasi have been prepared and submitted to the GSC. The Company has no funds for building the facilities needed to house the equipment, thus, procurement is not a high priority.

D. Spare Parts

A supply of "most frequently used" spare parts was included for the vehicles, tractors, and farming machinery procured by AID for the GSC. No provisions existed within the GSC organization for inventorying these parts when they were received and no storage space was available where the parts could be securely stored and readily retrieved when needed. Some parts were sent to the area offices along with the equipment and the remainder were stored in the headquarter offices in Accra. Each of the offices served as a spare parts repository. Records on the location of specific parts were sparse and over a period of time the identification of some parts was lost.

A major accomplishment of the Agricultural Mechanic Specialist was the development of a system for identifying, cataloging, inventorying, storing, and retrieving the spare parts at all GSC locations.

When the GSC moved into its new headquarters in Accra a stores room was established to house the spare parts, with labeled shelves and bins for ease in storage and retrieval. A card index was set up and parts from the Accra offices and other locations were brought in, identified, tagged, cataloged, and stored. When the specialist departed, this task was essentially completed and a stores person had been trained to operate the system. Some parts were not identifiable as parts for equipment currently being operated by the GSC. These could be sold to workshops or parts vendors in Accra, thus providing more space for usable parts.

The list of needed spare parts, prepared by the specialist prior to his departure, should be ordered immediately so that equipment critical to the GSC current operations can be kept serviceable.

E. Mechanics

The lack of qualified mechanics in the GSC organization is serious and is amplified by the lack of suitable workshops and tools, the age and condition of the GSC equipment, the lack of needed spare parts, and the fact that the equipment is widely dispersed throughout the GSC area offices and farms.

Only four people in the mechanization section are able to read and follow instructions in the equipment manuals. The only ones to do this routinely were the assistant engineer and workshop supervisor in Accra. Both are qualified and competent, but they must have a better support staff. Also, both would benefit from additional training on GSC equipment.

On-the-job training was the rule due to the lack of education and literacy of the majority of the mechanics. Although this training has improved the capability of the Company's mechanics, most have reached the limit of their ability.

F. Maintenance

A maintenance guide was prepared for use by the mechanics, although some were unable to use it due to their inability to read. A pre-season maintenance and repair program was conducted by each of the farms; the specialist worked with the mechanics and operators on equipment adjustment, lubrication, the need to keep nuts and bolts tight, and the proper operation of the equipment. The mechanics and operators know what they must do to maintain their equipment, but most do not appreciate its importance and fail to follow through on the maintenance program.

IX. PROCUREMENT

Procurement of vehicles, farm equipment and supplies, processing equipment, etc. provided to the Seed Multiplication Unit and later the Ghana Seed Company under AID Grant and Loan funds were handled by the Afro American Procurement Corporation (AAPC). The GSC became unhappy with the service provided by the AAPC and expressed their displeasure and concern to AID and also to the 1984 Project Evaluation Team. In their report the Evaluation Team recommended that Experience, Incorporated become the procurement agent for the remaining items to be purchased for the GSC under the Loan.

In September 1985 the GSC, following competitive bidding, negotiated and signed a procurement contract with Experience, Incorporated. However, AID Ghana delayed approval of all purchase orders until after the 1986 Project Evaluation Team completed its report and then, based on the Team's conclusions and recommendations with regard to the GSC's operations, AID made a decision to suspend any further procurements under the Loan. At Experience, Incorporated's request the GSC cancelled the procurement contract.

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X. EXTENSION/DEMONSTRATION COMPONENT

The Extension/Demonstration Component of MIDAS I was added to the Experience, Incorporated MIDAS I contract with Mr. Kenneth Haines as the Extension/Demonstration Specialist. The assignment was designed to continue for two years and had not been completed when Experience, Incorporated's MIDAS I contract ended December 31, 1981. Therefore, the Extension/Demonstration Component was included in the Experience, Incorporated MIDAS II contract and was concluded, under the Experience, Incorporated MIDAS II contract, with Mr. Haines departure in August 1982.

The Extension/Demonstration Component was designed to improve the performance and effectiveness of the agricultural extension service by introducing new techniques and providing training to its field staff.

The initial phase of this MIDAS Component was considered successful. The objective of initiating a crop demonstration program to upgrade the effectiveness of the extension service and introduce farmers to improved production systems for basic food crops was accomplished. Some progress was made in improving the extension officers' attitudes toward the project and the performance of their duties.

In general, the long-term success and promotion of the demonstration program and the extension service will be difficult to sustain. While the farmers would like to adopt some of the improved practices, many of the required inputs are not available to them or were priced beyond their ability to purchase them. The extension staff would like to travel and promote the latest crop production ideas; however, the GOG cannot supply the needed financial or program support.

If the extension service is to be a functional government organization and provide the large and small farmers with a positive, up-to-date extension service, it must have the unqualified support of the Department of Agriculture. Both physical and educational materials must be provided and updated regularly so the farmers can use the new information. The farmers and extension agents must be supported through the supply of tools, inputs, transportation, and the communication necessary to form a cooperative and productive unit. There is no indication this support will be forthcoming in the foreseeable future.

The GOG extension services should play an important role in the promotion of improved seeds by demonstration of their value to the farmers, and it has been frequently suggested that the GSC could improve their marketing efforts by working more closely with the GOG extension service. However, Mr. Haines appraisal of the extension service's operations and problems, as described above, would indicate that the agency is not presently in a position to offer any significant assistance to the GSC in marketing its seed.

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XI. PROJECT EVALUATION TEAM REPORTS

The Project and the GSC operations were evaluated by two AID Evaluation Teams, one of which issued a report in February 1984 and the other which issued a report in November 1985. The 1984 Team concentrated their evaluation primarily on the technical aspects of the Project, while the 1985 Team focused on GSC management, accounting and marketing. The findings, conclusions, and recommendations of these Evaluation Teams are in accord with the individual reports of the Experience, Incorporated Consulting Team and this Project Summary Report.

A. Evaluation Report of the Seed Multiplication Component of the MIDAS II Project, Issued February 1984

In its comments on the future prospects of the Ghana Seed Company the 1984 Evaluation made the following statements:

"Support to the Ghana Seed Company by the USAID has evolved as the most-likely-to-succeed element of an array of activities begun under MIDAS I and MIDAS II. Although beset by a myriad of impediments, the GSC is helping to meet a function which had been previously studied and rejected by the private sector. In the absence of this effort, Ghana's decline in food production would undoubtedly be much worse and the impact would be felt most severely by small farmers who currently produce upwards of 80 percent of the nation's food supply."

"The GSC is both organizationally and technically strong. Given a relatively small amount of further assistance and a few favorable cropping seasons, the GSC could become self-supporting and might even be in a position to export high quality seeds to neighboring countries."

"Once this is demonstrated, it is likely that there will be renewed interest in seed production by the private sector."

Below are a few statements from the 1984 Evaluation Report "Summary of Recommendations" that revealed some of the weaknesses in the GSC operations that subsequently evolved into major problems for the Company:

"Technical assistance to the GSC should include the one-year assignment of a management accountant. This consultant would assist the accounting department in setting up a standardized system of accounts at the main office in Accra and in the regional offices."

"It is recommended that GSC, in the short term, continue concentrating on tightening up its management over controllable variables and the accounting system, administration, and vehicle maintenance. The long run goals to be pursued are those of increasing overall production and productivity."

"Serious consideration must be given by the GSC and others to possible sources of financing for the future replacement of the Company's fixed assets."

"The GSC should continue its current "soft pedal" publicity approach in the mass media until its supply of rice and maize seed is more able to meet the demand."

B. Final Evaluation Report of the MIDAS II
Project, Issued November 1985

In his Prologue to the Evaluation Team Report Mr. William S. Lefes, Director USAID Ghana, set the stage for the Team's investigation with the following statements:

"Four of the six person team had participated in the 1984 evaluation, therefore, the learning curve on the current status of the project rose rapidly and a long period of orientation and reading-in was not necessary. The 1984 evaluation was thorough and comprehensive. It was deemed not necessary to plow again the same ground for a detailed technical analysis of the company. The recommendations in the 1984 evaluation, in fact, provides substantive indicators against which to assess progress.

"The evaluation, therefore, focused on the extent to which management and accounting systems were in place or were being established. These systems cover the management of production activities, stocks, purchases, sales and company financial record keeping and reporting. This emphasis, we believe, was appropriate for the evaluation as it provided the basis for review of a parastatal with a view to satisfying the concerns of the PNDC Secretary for Agriculture with regard to strengthening management systems in its parastatals where feasible and increasing the role of the private sector as appropriate."

Below are some of the conclusions reached by the Evaluation Team that Experience, Incorporated concurs is an excellent summary of the primary factors that have caused the Ghana Seed Company's current dilemma.

"It appears all parties to the project agreement had unrealistic expectations that a group of government workers as well intentioned as they might have been and well trained in agriculture would be able to operate a multimillion cedi commercial enterprise. Despite the handicap in lack of business acumen, credit is due to the civil servants who at least produced seed, stored it, and sold it to farmers under extremely adverse economic conditions."

"USAID may have erred in proceeding after the 1984 evaluation when it was evident that accounting inventory control and other management systems were not in place by that time and appeared unlikely to be established in the near future."

"It was evident that by 1983 the United States technical effort failed to come to grips with the management problems of Ghana Seed Company, e.g., it was dealing with a commercial enterprise that was unable to cope with the realities of a commercial seed company's management problems, accounting systems, maintenance and repair responsibility, pricing of commodities and a vigorous sales effort."

"GSC failed to adequately take into consideration the supply-demand situation in the economy and thus found itself guessing at prices, inventories, and sales projections."

Experience Incorporated concurs with the following recommendations made by the Evaluation Team with respect to the reorganization of the GSC. In general they track very closely those made by the Experience, Incorporated Consultant Team members in their end of tour reports. Selected recommendations of the evaluation team are as follows:

"A fundamental reorganization of the entire seed multiplication and distribution functions in Ghana is clearly indicated to enable a seed company to operate as a commercial entity."

"The Government should be prepared to reorganize the seed company as soon as possible."

"Reduce the scope of operations of the seed company."

"Reorganize a seed company around a corps of technically competent GSC personnel who have demonstrated their skills over the years."

"Establish a wage and salary scheme that is competitive with the Ghana Private Sector."

"Reorganize foundation seed farms and operate them as economic farming units. They should be located reasonably close to area offices to ensure adequate logistic support and oversight."

"Install a management team to take over the functions of General Manager, Finance and Technical Directors. Duration--up to four years."

XII. GSC'S FINANCIAL DILEMMA, CAUSES AND EFFECTS

The Ghana Seed Company has serious financial problems and it is unlikely that the company can continue operations without financial and managerial assistance from the Government of Ghana and a donor country.

There have been an unusual number of events and decisions that have led to the present situation. Many were of external origin over which the GSC had no control; however, decisions or lack of decisions on the part of the GSC management also contributed to the current financial situation.

New companies that become successful react to market needs, developing needed facilities and management organization as sales income justifies the added costs. The GSC was not allowed to grow with the market. It inherited an overgrown government agency, with some seed production and processing skills and facilities, and was asked to develop an organization and facilities to meet, what has turned out to be, over optimistic farmer demand projections for maize and rice seed.

Seed multiplication was the only survivor of six components of the Managed Inputs and Delivery of Agricultural Services (MIDAS) program initiated by AID in 1976. The demise of the other components (fertilizer, credit, extension/demonstration, marketing, and research) had a negative impact on the market demand for improved seeds.

Assistance to the GSC concentrated on production and processing, in these areas the needs were visible and capital inputs were required. Minimal assistance was given to the management and marketing because GSC Management was confident it could handle these functions without outside assistance.

The prolonged delay in completing the Winneba seed drying, processing, and storage facility consumed an inordinate amount of management and consultant time and opportunities were lost for potential seed sales. Delays were caused by local shortage of building materials, lack of GOG funds to pay contractors, and the U.S. imposed moratorium on the procurement of equipment and supplies under the AID Loan from April 1983 to July 1984.

The GSC experienced two fires in 1983 that substantially reduced its ability to provide maize seed in 1984 when the demand was greater than the supply. At Kumasi the seed processing and storage facilities were destroyed. At Winneba the refrigeration and other equipment awaiting installation in the new plant was destroyed.

The severe drought in Ghana in 1983 resulted in the importation of surplus quantities of donor grains. These surpluses depressed the market prices of grains below farmer cost of production causing farmers to plant about half of their normal acreage; thus, potential GSC seed sales in 1985 were reduced.

With the formation of the GSC the government seed subsidies that were accorded farmers by the Seed Multiplication Unit were discontinued; this required farmers to pay substantially higher prices for the improved seed than they could obtain for their own commercial production in the marketplace. Many farmers chose to use their own seed rather than pay the higher price.

The Seed Multiplication Unit was perceived as a "national need" and GSC Management has continued to hold this perception rather than thinking of the company as a profit oriented entity. This has led to decisions that were not always in the best interests of the company.

It has been difficult for GSC management and staff to adjust from a government supported agency to the realities of a self-supporting parastatal. This is evidenced in management's lack of recognition of problems and its reluctance to make and carry out unpopular decisions that were necessary for cost containment, such as:

- o The retention of a large workforce at a cost that is not justified by current or potential income from seed sales.
- o The failure of GSC Management to consolidate foundation seed production into fewer and more profitable farms.
- o The inability of the company to control the timely delivery of contract grower certified seed to its processing plants.
- o The failure of GSC Top Management to recognize the lack of performance of the accounting and marketing sections and take corrective action.

Given the above problems and constraints it is doubtful that any newly established company in the United States or elsewhere could have been any more successful than the GSC. Mr. Wobil and his staff are to be commended on their determination and commitment to make the GSC a successful parastatal. They had the desire and the will, but the odds were against them.

XIII. RECOMMENDATIONS

As stated previously, Experience, Incorporated is in general agreement with the recommendations of the 1985 Project Evaluation Team. A consolidation and streamlining of the company is essential both to reduce costs and to make it a manageable entity.

The company has focused its production and marketing attention on two crops, maize and rice, plus the marketing of vegetable seeds furnished by AID. The potential income from these cannot maintain the GSC's current facilities and staff. These costs must be reduced or the product line expanded to generate more income.

It is recommended that the GSC continue to focus on its present product lines, making appropriate reductions and consolidations to bring costs in line with income. When a good nucleus company has been established it can begin to add other seeds and possibly tubers to its product line.

There is general agreement that outside managerial assistance is needed to implement the reorganization of the GSC. Ideally it should be a seed company. At Mr. Wobil's request Experience, Incorporated approached some United States seed companies with the concept of becoming a partner and manager of GSC and found no interest. Whether a seed company, a consulting company, or individuals are retained by the GOG to implement the reorganization they must be given the authority to make and carry out decisions. Advisors without authority cannot accomplish the job that must be done.

Some specific recommendations for improving GSC performance and reduce costs are:

- o Reduce the number of foundation seed farms to five, abandon the others and distribute equipment and moveable facilities to the operating farms.
- o Discontinue the multigrower concept for certified seed and contract with a few strategically located large commercial farms to produce the needed seed.
- o Reorganize the financial functions under a qualified controller who can provide guidance, leadership, and training in all areas relating to accounting and the guardianship of the company's funds and physical assets.
- o Install the accounting system designed by Mr. Hill.

- o Place greater emphasis on marketing including: the employment of a qualified marketing director, development of market plans and strategies, and the commitment of sufficient funds for implementation.
- o Establish a market intelligence function within the accounting department.
- o Complete the construction of the processing and workshop facilities at Winneba, Kumasi, and Tamale. Initiate maintenance and repair programs at all GSC plants.
- o Improve guard services, and fire detection and controls at all GCS facilities.
- o Improve farmer confidence in GSC seeds by placing greater emphasis on the proper handling, storage, and testing of all seeds the company offers for sale.
- o Place the GSC vehicles, farm equipment, workshops, and spare parts, together with the drivers, operators, and mechanics under the control of a qualified mechanization manager to insure the proper care and use of these valuable company assets.

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GHANA MIDAS II SEED MULTIPLICATION PROJECT
PROJECT NO. AFR-0102-C-00-2003-00

END-OF-TOUR REPORT

ORRIS H. SHULSTAD

Technical Coordinator and Seed Processing Engineer
January 1, 1982 to March 31, 1986

I. INTRODUCTION

The objective of MIDAS II was to provide sufficient quantities of improved and proven varieties of seed, at a cost acceptable to Ghanaian farmers, to enhance their productive capacity.

MIDAS II was a continuation of the approximately five year endeavor under MIDAS I; that was, assisting various Ghanaian Institutions in establishing systems for providing agricultural services to the small farmers of Ghana. These were credit, extension/demonstration, marketing, fertilizers, small farms research, and improved seeds.

During Midas I the Seed Multiplicaton Unit (SMU) of the Ministry of Agriculture was converted into a parastatal, the Ghana Seed Company (GSC), and the organizational structure of the GSC was established.

Also, the capacity for breeders seed multiplication was strengthened on the four foundation seed farms operated by the GSC. The GSC sold the foundation seed to contract seed growers who produced certified seed which was then purchased from the growers by the GSC. The GSC dried, cleaned and stored the foundation and certified seed for sale to the farmers during the next planting season.

At the beginning of MIDAS II the efforts of the project components were focused in the Brong-Ahafo Region as a pilot demonstration for the country. However, during the implementation of MIDAS I and II there were five changes in the government and the economic decline accelerated as the GOG was unable to address its macroeconomic stabilization issues. As a result a number of the MIDAS II components declined due to lack of support from the Ghanaian cooperating institutions.

In 1982 USAID held discussions with all relevant Ghanaian institutions following which an agreement was reached to modify some of the components and discontinue others. The seed component was selected to be continued and the development of the GSC became the primary component of the revised MIDAS II project. Amendment No. 1, dated February 28, 1983 read as follows:

The major objective of the revised MIDAS II project was:

"To improve and expand the institutional capacity of the GSC, resulting in a viable, independent, profit making company."

The impact upon total production was envisioned as follows:

"Research results in Ghana indicate that the use of certified seed over traditional seeds can increase yields by 20 percent to 80 percent over the current yield."

The GSC, as a private sector seed company, was envisioned as a national need to assist the GOG in its efforts to meet the food production requirements of Ghana.

Within two years after the development of the MIDAS II program in 1980 not only had the scope and goals of MIDAS II been drastically reduced; but, it was also becoming increasingly apparent severe shortages in building materials and lack of GOG ability to provide construction funding would curtail the planned seed plant building program.

Buildings in Ghana are basically reinforced concrete with little or no wood used due to termites and pre-fabricated buildings have rust problem under high humidity conditions. Iron rods for reinforced concrete construction are fabricated from junk metals but certain additives must be imported; likewise all components for making cement must be imported. There were no provisions in the project agreement to import either cement or iron rods. These shortages together with the lack of GOG funds to pay construction contractors resulted in serious delays in the building of the planned seed plants. The Winneba seed plant was initially planned to be operable by 1982 but was not ready to receive seed until 1985.

From 1976 through 1983 the SMU/GSC foundation seed farms and seed growers could not meet the Ghana farmers' demands for improved seeds. The GSC was not in a position to increase its seed production to meet these demands, lacking both processing and storage facilities.

Although both seed production and, hence, sales were lagging the new company was increasing its staff and other operations to handle the seed requirements of the country. In 1981 the GOG ceased its subsidy on seeds, which further aggravated the GSC's financial situation.

Political disagreements between the Ghana Government and the United States in 1983 resulted in a freeze being placed on all procurements in April 1983 that was not lifted until July 1984. The only project support allowed during that period was technical advice provided by contract personnel operating in the country at the time the freeze was imposed.

The MIDAS II contract with Experience, Incorporated (EI) was scheduled to end September 30, 1984. Since the recommendations of the 1984 Evaluation Team were still being considered it was temporarily extended to December 31, 1984. This was later amended to September 30, 1986 with in-country technical assistance to be completed by March 31, 1986.

The impact of these short extensions was disappointing as items essential to the completion of the project were not purchased and delivered as per expectations. As of February 1986 PIO/C documents had not been prepared on any of the commodity items that had been initially agreed upon in 1982 and later revised in February 1984. The lack of essential seed processing, agricultural production equipment, and repair parts will have a very serious impact on the future operations of the GSC.

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II. SCOPE OF WORK

A. Responsibilities of the Technical Coordinator and Seed Processing Engineer

The technical assistance contract services on MIDAS II covered in this report are a continuation of services performed by this technician on MIDAS I, since Experience, Incorporated was the contractor for both projects. MIDAS II was a technical services contract rather than a management type contract as alluded to in the 1985 Evaluation Report. The MIDAS I contract did have a technical management advisory component but that was eliminated in the MIDAS II contract. As Technical Coordinator this technician did provide advice on management issues and problems that were within the scope of his experience.

The major responsibilities and duties as Technical Coordinator were, but not limited to:

- o Assisting the GSC in the overall supervision of personnel, operations, and management.
- o Providing technical and managerial assistance to the Processing, Production, Quality Control, and Sales and Distribution Sections, all units of the GSC.
- o Assisting in business and fiscal procedures.
- o Advising the GSC Board of Directors on matters of policy, pricing, and contracting.
- o Providing advice and assistance to the Public Relations and Education Director (a position that was never established by the GSC).
- o Advising the Research Manager.
- o Serving as liaison to the National Seed Committee (this role was taken over by the Quality Control Consultant when this position was added to the project).
- o Acting as liaison to the Ghana Seed Inspection Unit (this was also taken over by the Quality Control Consultant).
- o Developing local and overseas training programs for selected GSC staff members.
- o Advising on staff selection, job placements, their training in: seed technology, plant pathology, plant breeding, and agricultural engineering (the latter role was assumed by the Agri-Mechanic Consultant who was added to the project near the end of the contract).

- o Contribute to improving communication of seeds information to extension personnel and farmers (the GSC Research Manager undertook this role).

The general responsibilities as a Seed Processing Engineer included, but were not limited to:

- o Providing guidance and assistance in planning and construction of the four seed processing centers of the GSC.
- o Preparing specifications of equipment for seed drying, seed processing, conditioned seed storage, shop equipment, mechanics' tools, and seed testing equipment.
- o Assisting with the supervision of the unloading, clearance, and installation of the equipment; testing all components; and start-up of the seed processing facilities to insure they are working properly.
- o Training seed processing personnel to operate, maintain, service, and oversee the facility unassisted.
- o Prepare operation manuals for operators of the seed plants.

A detailed discussion of the construction and operation of the seed plants is provided in Section IV of this report.

B. In-Country Support

Throughout the entire tour excellent day to day working relationships were maintained with the GSC management and staff. This type of relationship was experienced by all members of the EI consulting team in providing guidance, training, and dialogue with counterparts, farmers, contractors, and suppliers. The GSC management and counterparts were receptive to recommendations for improvements and changes that would strengthen the various segments of the GSC.

Support was readily provided by USAID, AESC and others enabling on-going developments to be completed on a timely basis. This technician served as the project expeditor conferring with the AESC Project Engineer, Installation Director, Water Engineers, Structural Engineers, and their supporting staffs to stimulate, arrange, consummate, plan, and execute all the various details involved in the seed plant construction effort. The primary construction was at Winneba, with a lesser involvement at Tamale and Kumasi where plant construction was not as extensive.

C. Constraints

The most obvious constraint to the completion of the project was the lack of construction materials for the new seed plants. This was the major reason that the Winneba plant was not ready for operation until 1985. It is also the basic reason that the Kumasi and Tamale plants have not been completed as planned.

A second set of constraints, all of which were affected by the above, were:

- o Contractor's performance could be rated as "poor" for many good reasons: lack of laborers on site; lack of concrete mixers on site; management not visiting site or backstopping foremen; and lack of water for both drinking and making concrete. These and other conditions caused frequent work stoppages, occasionally for long periods of time.
- o Promised construction materials support by the Ghana Government did not materialize.
- o Ghana Government's inability to pay contractors for work completed caused work stoppages due to contractors lack of funds to purchase materials and pay laborers.

Credit must be given to USAID for their attempts to influence Ministries directly involved to provide the needed support to the project. These efforts received very limited responses as the GOG did not have the resources to sustain even this modest building program.

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III. PROJECT FACILITIES, DESIGN AND CONSTRUCTION

A. Background

This technician arrived in Ghana on August 25, 1977. At that time, the MOA Seed Multiplication Unit (SMU) was housed in cramped quarters in the MOA Annex area down by the seaside. Three SMU officers and all the staff were housed in six small offices. The SMU had been relegated a very low level of support by the MOA but had performed credibly in the distribution of seed maize, rice, and groundnuts.

All developmental efforts were coordinated between SMU, USAID Food and Agriculture officers, and the EI consultants. All decisions were made unanimously by all parties.

Prior to the entry of the EI consultants, Mississippi State personnel, knowing shortcomings in seed maize drying, processing, storage capabilities, and knowing the demand quantities projected at that time, had provided plans for expansion. Four plants were to be built by MSU, EI, USAID, MOA criteria and decisions; Winneba was to be the first. When Winneba had been started for six months, the Kumasi plant, identical to Winneba's, was to have been started. Ground-breaking ceremonies, including the American Ambassador's presence took place at the Kumasi site on October 24, 1981; however, the contractor who bid the works delayed start-up awaiting GOG guarantees of materials. USAID, after studying the Kumasi situation further, decided not to support the Kumasi works project. Hence, it was aborted although all equipment for the Kumasi project had arrived in Ghana. The Experience, Incorporated contractors had no input on this decision.

The third plant, following the Kumasi plant, would be built at Tamale. A complete set of draft drawings were made by this technician for the Tamale new seed plant. By 1979, it became apparent that a reduced effort should be envisioned for Tamale.

The fourth plant was to be built at Ho. A plot site was dedicated inside the Ho city limits, and still remains a designated new plant site for the GSC. A much smaller capacity plant was to be built at Ho.

The fifth location, the GSC plant at Bolgatanga, was not mentioned in any USAID or MSU documents for improvements. This facility was considered a subsidiary of Tamale, even though it is 100 miles farther north. This was a misconception as it is presently a significant part of the Company in terms of income earning capability providing as much as 15 percent of company earnings, second only to Tamale, but far exceeding Winneba, Ho, or Kumasi income earnings for the GSC.

This technician began working immediately with the Architectural Engineering Services Corporation (AESC) architects and engineers to develop draft designs for the Winneba and Kumasi facilities. Getting GOG commitment to commence these plans took over one and one-half years.

By February 1978, specifications for all equipment for the two seed plants, for seed testing, and for a first set of shop tools and shop equipment had been developed by this technician. Funding was readily available from USAID for procurements under loan and grant basis. Farm machinery for the foundation seed farms had been ordered previously and began arriving in early 1978 and was placed in operation immediately.

USAID PIO/C procurement commenced through AAPC and all seed drying and seed processing equipment, seed laboratory supplies and equipment, tools and shop equipment had arrived in Ghana and was cleared through the ports by March 1981. Award of construction for starting Winneba was made in July 1980 but construction start-up from the outset was very slow and equipment intended for the new seed plant and dryers had to be stored in the open.

As of January 1, 1982 there were no structures completed at the new Winneba seed plant site and equipment continued to be exposed to the elements of weather. By the end of 1982, only 20 percent of construction was completed on the first phase Winneba seed plant structures.

The above facts are cited to show the slowness with which events occurred even after the arrival of the Experience, Incorporated team members.

During this time the SMU had become the GSC and had moved its headquarters into a rented house about six miles from its first office in Accra, the capital city. This space was also inadequate for staff needs. In May 1985, another move took place to a spacious three-floor building donated to the GSC by the GOG.

B. Design of the Winneba Seed Plant

The Winneba seed plant has a rated capacity for 25,000 maxi-bags annually (200 pound bags). One-fifth of that capacity was programmed to be used for carryover stocks, to ensure against seed crop failures the following year. Seed drying and seed processing are compatibly rated as to hourly capacity, daily intake potential, and annual seed target goals.

It is estimated that 6,000 acres of contract seed production within a radius of 25 miles can be generated to supply the Winneba seed plant, assuming 10 maxi-bags production per acre. The goals set include accomplishing the intake, shelling, drying, processing, bagging, and storing in about 60 working days time. In any seed intake operation speed is essential in order to bring in seed with the least amount of deterioration. In a tropical situation, timing is especially critical since weevils, rodents, and ear molding all reduce quality unless prompt action is taken to bring the production in promptly.

The design of the Winneba seed plant was not large. It could only supply a very small part of the total seed needs of Ghana should it ever occur that a new variety had to be supplied to the nation's farmers. The situation of Southern Leaf Blight menace in the United States some years ago supports the rationale for the capacity of this new plant. It may end up being the only plant to be built for Ghana in the foreseeable future.

C. Phase I Construction of Winneba Seed Plant

1. Award of Contract, July 1980:
 Ø4.4 Million
2. Revised Valuation at 1982:
 Ø9.9 million
3. Total Expenditures to December 31, 1985:
 Phase I construction - Ø33,702,728.00
 Equipment installation, insulation of seed storage (only
 20 percent completed) - Ø40,255,591.00
4. Devaluations and Upgrading Minimum Wages Effects

The exact impact of demonitizations and labor wage increases cannot be accurately assessed but escalated cost more rapidly in the latter half of the Winneba project. The project started in 1980 when the exchange rate was Ø2.75: \$1.00.

| | |
|----------------------------|--------|
| Prevailing January 1, 1984 | 30:1 |
| April 1, 1984 | 35:1 |
| August 27, 1984 | 38.5:1 |
| December 1, 1984 | 50:1 |
| April 18, 1985 | 53:1 |
| August 12, 1985 | 57:1 |
| October 4, 1985 | 60:1 |
| January 11, 1986 | 90:1 |

The minimum wage for most of 1985 was Ø70 per day. This rate was changed in January 1986 to Ø90 per day.

Table III-1 shows the construction progress at the Winneba seed plant from 1981 through 1985.

TABLE III-1. RECORD OF CONSTRUCTION PROGRESS - NEW WINNEBA PLANT

| | December 31, | | | | |
|---------------------------|-------------------|------|------|------|------|
| | 1981 | 1982 | 1983 | 1984 | 1985 |
| | -----percent----- | | | | |
| Conditioned Storage Block | 8 | 25 | 45 | 75 | 100 |
| Seed Processing Building | 59 | 75 | 93 | 98 | 100 |
| Regional Headquarters | 13 | 30 | 66 | 99 | 100 |
| Wagon Dryer Shed | 71 | 97 | 100 | 100 | 100 |
| Column Dryer Facility | | 10 | 75 | 98 | 100 |
| Electrical Substation | | 10 | 100 | 100 | 100 |

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D. Imported Equipment Utilization

Two sets of seed processing, drying, and seed laboratory equipment were purchased and received in Ghana in 1980-81. Of the two sets only the following remain not utilized at end of MIDAS II:

- o One column dryer facility - now at the Winneba site
- o Five pre-fabricated square bins - originally planned for Kumasi and likely to be set up at Kumasi

All other imported equipment was put into operations.

Two options for use of the column dryer would be to sell it, or erect it at the opposite end of the Winneba seed storage unit and use it for commercial drying of food maize. The same contractor who erected the present dryer should be used. This should be done promptly to prevent total destruction by rust.

E. Costs of Seed Plant Equipment Imports

At the end of 1985, approximately \$2,080,372 of seed plant commodities had been imported for the Winneba and Tamale seed plants. Not included in the above are trucks, farm machinery, or quality control equipment and supplies.

Some additional expenditures are being incurred with the import of generators for Winneba and Tamale, and electrical items including a transformer for Kumasi (630 KVA).

Over the four year period (1982-1985) an additional \$200,000 was spent on emergency commodity procurement for replacement parts, supplies, etc. for vehicles, farm machinery, and seed plant equipment. This enabled getting equipment and vehicles operational within two months after being idled. This technician prepared purchase orders, obtained clearance documents, cleared the goods, inventoried, placed into stores, and issued inspection and receiving reports to USAID.

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IV. EVALUATIONS OF THE GHANA SEED PROJECT

Three evaluations were conducted by USAID over the project period:

- First: Report dated June 1, 1979.
Redesign dated 1980 to prepare for MIDAS II.
Amendment No. 1 to Project Paper, MIDAS II, dated February 28, 1983.
- Second: January/February 1984. This further scaled down the project goals from that delineated in the Amendment No. 1 to the Project Paper for MIDAS II.
- Third: November 1985, the "final" evaluation on MIDAS II Report issued in February 1986.

The MIDAS II Project Paper developed in 1980-81 set forth the plans to include four seed plants: Winneba, Kumasi, Tamale, Ho.

The Amendment No. 1 reaffirms this plan, quote:

"Initial emphasis was designed to provide new processing facilities first at Winneba and then at Kumasi. Depending upon timely completion of this phase, the Tamale facility was to be included later (and possibly Ho). The Winneba unit was considered critical and essential as it is located near Accra and in a profitable maize producing area. Both proximity to Accra for logistical and raw material support and availability of seed sources made this site selection quite favorable. Hindsight, however, revealed that Kumasi should not have been chosen as the second site, but rather Tamale. Production capability, existing facilities, and climate should have been overriding factors leading to the choice to Tamale over Kumasi."

The Amendment No. 1 further stated:

"In addition, expansion of the facility at Kumasi will be cancelled and all equipment ordered for it will be delivered to the Tamale site."

Thus, all support was immediately cancelled for expansion of the Kumasi GSC facility. A major impediment at Kumasi was the distance to contract seed growers over very bad roads. The closest seed grower was 35 miles, and growers were spread out up to 90 miles, from the Kumasi GSC. Most of the equipment at Kumasi was destroyed by fire. The items destroyed are currently

programmed for replacement under loan funding procurement to enable the GSC to provide seed to this major maize production area.

No further planning had taken place for either the Ho or Bolgatanga facilities.

As scaling down was occurring, due mainly to slowness of plant completions along with GOG inability to support the original plans, an "in-country" self evaluation took place. Hearings were held involving MOA, MFEP, MIDAS Executive Committee, USAID, and Bank of Ghana on the six components of MIDAS. This occurred in late 1981 and early 1982. Only the seeds component remained intact for forward completions, while other parts of the other five sectors were scheduled for phasing down in an orderly manner. The work of the EI technicians was to continue as per the EI/USAID Contract except that the Extension-Demonstration component was to phase out by August 31, 1982, which occurred.

Only in the third evaluation in 1985, did evaluators come down "hard" on the apparent failures of the GSC in management, sales, and fiscal capabilities. The second evaluation had only alluded to potential problems. Factors, mainly economic, over which the GSC had no control set in during 1984, accentuated to a crises stage in 1985, and going into 1986 appeared to spell total collapse of the GSC on the singular matter of liquidity. At that late stage in the over-all period from 1976 to 1986, fiscal, sales, and management had succumbed to pressures they were not able to cope with. Only if 1986 brings an unexpected turn-around does the present GSC setup have any chance of survival. Otherwise, reorganization and restructuring must be strongly considered by the MOA and the GSC Board of Directors. All of these events were still future as the end-of-tour for the technician drew to its end.

A. 1984 Evaluation

A mid-project evaluation by USAID in January-February 1984 on the GSC firmed up the ideas needed to complete the efforts outlined in the Amendment No. 1 document.

- o Project Agreement Completion Date (PACD) to end December 31, 1985. Participant training to be done in both 1984 and 1985.
- o The team revised the commodity list and urged immediate procurement of same (from listing in Amendment No. 1).
- o A financial management consultant was recommended to serve one year to assist in the organization of the GSC accounting department.

- o Completion of the Winneba seed plant in time to handle 1984 maize seed. (Unfortunately, the needed electrical items procured through USAID arrived February 1985, negating the use on 1984 crop.)
- o Special training by Mississippi State University specialists was urged.
- o Items in-country originally procured for Kumasi should be set up in Tamale to process rice seed.
- o Expansion into production of local vegetable seed was urged. (Garden egg, hot pepper, okra, Bakwu red onion, especially.)
- o Phasing out of the MIDAS Project Executive Committee was urged. (Done at the end of 1984.)
- o GSC was urged to tighten its management over controllables; the accounting system, administration, and vehicle and equipment care and maintenance. (The Agri-Mechanic had not arrived to assist the GSC at that time.)
- o "Soft pedaled" advertising was urged on the GSC of seed sales until larger quantities of seed became available. (Inference was that seed supplies were short in supply; the exact opposite trend occurred in 1984 seed sales, seeds did not sell.)
- o A pre-fabricated warehouse building for seed processing at the Kumasi GSC was recommended. (No action was taken.)
- o Four drying wagons at Winneba should be transferred to Kumasi for maize seed drying. (A fire in 1983 at Kumasi destroyed AID procured equipment leaving this branch without seed handling capability.)

B. The 1985 Evaluation

In the final evaluation, conducted in November 1985, the Team Leader, William Lefes, USAID Director, Ghana, stated:

"The Contractor, Experience, Incorporated (EI), had an opportunity to establish management procedures that were necessary for the effective operation of the company and to train management staff to carry out its responsibilities. The same can be said for accounting and marketing as well. The contractor did not do so. The GSC finds itself in due straits and is unable to analyze the reasons for its difficulties. Experience, Incorporated acknowledges that it had emphasized the seed technology aspects of the project and provided experienced staff. The USAID has taken a much harder line on this shortcoming than the team of 1984, for example...."

This technical assistance consultant wishes to direct the attention of all concerned, USAID, Evaluation Team, and Experience, Incorporated, to the Third Annual Technical Report, March 1985, wherein the problems had been diagnosed, made known to those receiving the report, and anticipating rapid response to address the problem areas.

Unfortunately, the time-lag between identification of the problem, assignment of the needed personnel expertise, and arrival often take a year or more. Earlier Evaluation Teams should have sounded a louder "alarm" over these matters. The whole notion of just recently discovering the deficiencies cannot be accepted. From the inception of the project developments, recognition should have surfaced over the likely futility of placing civil servants in a business role or in a management role in a business. In the capitalist world, business-type trained personnel run a business and government personnel only take on the matter of running any essential business when the business is of a "high emergency", as in the case of a railroad strike, which would paralyze the country's transport. Government personnel require training before assuming a business role.

USAID, from the very inception of the project, knew that the personnel who would manage the GSC were government civil servant workers. However, the Chief Accountant, the Sales Manager, the Internal Auditor of the GSC were not governmental workers. They were business-trained officers. They also come in for scathing criticism.

Meddling into the internal affairs of Ghana is something to be avoided. This has been elucidated by GOG. To have forced the issue of requiring change in personnel in the GSC would likely have resulted in expulsion from Ghana for attempting to meddle too far into internal affairs of Ghana. Therefore, the question which rightfully must be raised is: "Should the United States dictate the kind of personnel they are to work with on all development projects?" This would be an extremely sensitive issue. Granted, when a sensitive situation exists, dialogue to correct is in order, but a forceful resolution cannot be done in instances such as called for in the 1985 Evaluation Report.

During the MIDAS I Phase of the project there was a management consultant (John Sutherland) on the EI team. When his assignment was completed in July 1981 USAID and the GSC decided management assistance was no longer needed and this position was eliminated. From then on EI was only asked to supply technical advisors.

To the extent of his experience and background this consultant provided advice and training to the management staff throughout this contractual period on a day to day basis. Also,

USAID provided participant training abroad for top management. Was the USAID participant training inadequate? Could this USAID training been improved upon?

The deficiencies of Company personnel cannot rightly be placed at the door of the Contractor (Experience, Incorporated) when there is a Board of Directors who monitors affairs, events, proceedings, faults, deficiencies, and sets policy for improvements. This Board had known of the fiscal problems long before any evaluation team came on the scene. The system of external audits conducted under Ghana laws, surfaces all of the deficiencies which the evaluators have found. Such External audit reports were privileged documents not for the scrutiny of the EI team members. Even the affairs of the Board of Director's are privileged and classified to use by foreign personnel.

In conclusion, the philosophy, whether good or bad, but which generally works out for the best interests, is to determine goals to be achieved on the project, amend as necessary, correct wrong ideas, and aim for a workable set of developments.

Hence, as evaluations were carried out, to officially change in mid-course, the Contractor (Experience, Incorporated) personnel agreed. Incidentally, the Contractor's team personnel or officers (Experience, Incorporated) were never accorded participation in decision making evaluation processes in any of the three evaluations carried out over the eight plus year period. This is a serious mistake, as if the experiences and knowledge of the Contractor personnel are invalid and worthless. Such should not be a part of any United States project development.

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V. INSTITUTIONAL CONSTRAINTS

A. Construction Progress

Slowness permeated the entire process of construction of the Winneba seed plant. The very same problems which were encountered would have occurred regardless of the size of the plant. Shortages of cement, iron rods, water, on-site equipment (concrete mixers, dumpsters, land leveling equipment, excavation equipment) existed for periods of months and even years so it seemed the project was successful basis the accomplishments that did take place.

The Winneba construction program was split into three phases:

Phase I: Structures that were deemed most urgent: wagon dryer facility, column dryer erection, seed processing building, seed storage facility, and headquarters.

To have started other essential works, such as the workshop, would have aggravated the materials supply situation.

Phase II: Workshop, Workers Canteen

Phase III: Rest House, two officers quarters (houses)

Lack of funding prevented even considering starting Phases II and III.

Restrictions were enforced by GOG on proceeding with any new works by any additional contractors. Another restriction was the annual funding allocation to various works which the GSC wanted to undertake; GOG was seemingly always quite generous in its allocations for this basic seeds industry.

The Experience, Incorporated administrator and technicians were in agreement at the start of the project in 1977 to follow Project Agreement plans. Also, whenever changes had to be made in cancelling Kumasi, Tamale, and Ho constructions, the administrator technician concurred as it was evident the GOG could not support such an ambitious effort. GOG's needs in other more critical areas were justifiably correct. When reductions in construction were called for, more attention was placed on other developmental areas of the SMU and the GSC.

B. The "Freeze" Situation

The political impasse between the United States government and the GOG directly slowed down seed production and plant construction that had been planned from April 1982 to July 1983. Only technical services were provided during that period. The GSC 1985 Revised Implementation Plan was ignored and that effect lasted to the end of the tour for this technician. No procurements were made to fulfill the needs of the project. Many parts that should have been supplied for upgrading both Tamale and Kumasi capabilities were not provided. These were great disappointments to the technician and the project administrator.

C. Absence of USAID Development Officers

Following the 1983 reduction in USAID project force, the position of ADO was vacant for substantial periods of time.

On two occasions TDY ADO's were present for several weeks; however, neither were available for long enough periods to be of substantive assistance in addressing and resolving project issues. There was another lapse from June 1985 until the departure of the technical assistance team leaving a void in the chain of communication with respect to project developments, problems, issues, etc. and provided no protocol for seeing the Mission Director.

The USAID Director had other matters seemingly beyond the day-to-day project issues, problems, etc. Therefore, when no GDO or ADO, or Project Manager was at Ghana Mission posting, matters started "falling apart" and project developments suffered.

D. Relationships Between Mission and Contractor Personnel

Though cordial in appearance relationships were not satisfactory. The Mission did not entertain memoranda, reports, letters, or communications from Contractor (Experience, Incorporated) personnel. Only when these were requested by the Mission were such written materials acceptable. Otherwise, these were not wanted in the Mission files and were returned to the contractor personnel.

Dialogues with Mission personnel were at a very low ebb in the latter part of the contract period. Though a suggestion was made to hold informal dialogues, no follow-up was made to call in personnel which left a void of considerable dimension in a normal line of communication for both parties regarding a major

United States development effort. The Chief of Party could have provided valuable project orientation and familiarization to the new USAID officials.

E. Procurement Failures

Procurement of needed project commodities on which specifications were prepared did not materialize. The Revised Implementation Plan of 1982 prescribed commodities for procurement which became "frozen" due to the political impasse.

When the ban on procurement was lifted the GSC requested that AID replace AAPC as the Procurement Agent for the equipment to be purchased under the loan agreement. This change required tendering, a process that took nearly a year to complete. The Tender Committee selected Experience, Incorporated as the new Procurement Agent and a contract was negotiated and signed on September 15, 1985. In November the GSC requested that a Letter of Commitment be issued by the Ghana Mission in favor of Experience, Incorporated. The GSC also submitted a listing of the items to be purchased together with specifications and requested Mission assistance in the development of the PIO/C. The Mission Director advised the GSC that AID would not proceed with the procurement until other decisions relative to the future of the GSC had been resolved. This was a great disappointment to this technician as most of the items on the procurement list are crucial to the continued production and processing of seed by the GSC.

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VI. ACCOMPLISHMENTS

A. Training and Guidance

Ongoing day-to-day training and guidance was carried out with GSC management and counterparts. Throughout the project the technician's office was always located adjacent to management offices of the GSC.

Training consisted of discussions and advice on issues related to company operations, construction matters, equipment installations, personnel performance, seed sales, and production programs.

Training in seed plant operations was of the practical "hands on" kind on all pieces of equipment being used. Supervision of foremen and head men in seed drying, seed processing, and handling and storage was successfully carried out.

There was a willingness by the Ghanaians to learn whatever was "new" in seed plant operations. The machinery which had been provided was adequate for the current needs at each location. The GSC personnel discovered the labor-saving aspects of performing duties when they were assigned.

"Hands on" training was successfully conducted on seed drying equipment also. The demonstration method of training worked quite well, followed by hands-on application on seed drying, also shown to be applicable to processing equipment.

Language barriers had to be recognized and adjusted for by slowing up discussions and using translators to provide the needed understanding of the uses of equipment.

Technical assistance was provided to all management officers of the GSC. Having experience in seed company operations and management experience in Ghana and training in the United States, the GSC management was amenable to suggestions and recommendations. Advice was freely offered at all times and courteously received.

Usually, the technician pursued technical areas with which he was experienced. The financial matters which surfaced in 1984 and 1985 were outside the scope of this technician. This required the addition of a fiscal management technician, who finally arrived in 1985. Attempts had been made to add such a person for over a year previous to the actual arrival.

B. Technical and Managerial Assistance

Technical advice on a day-to-day basis was provided to the Managing Director, the General Manager, and to the Processing, Production, Quality Control sections. Lesser assistance was provided to the Sales and Distribution manager because he was seldom at the Headquarters of the GSC. The Research Manager also made use of the technicians guidance and expertise in any area he needed assistance.

There was never a lack of coordination of efforts to encourage, improve upon, or even criticize shortcomings hoping to do some good toward self-improvement in the individuals. "Stepping on toes" generally was done softly but generously and persistently when the situation demands.

Excellent working relations prevailed at all times with all GSC personnel. Rifts did not occur. Encouragement of job performance was offered without any ill feelings. Business attitudes were fostered.

The technical team set examples by being prompt to work in the morning. The "small" things in any business count and these were constantly pointed out to improve upon discipline. In spite of these efforts, the persons responsible for bringing discipline into the system were the Managing Director and the General Manager. They also could have set better examples and taken more effective disciplinary actions for failure to perform their assigned tasks.

Whenever any technical information was called for, if within the knowledge of this technician, it was provided indepth. In the matters of seed plant design(s), seed plant equipment selection, contractor selection in the bidding processes, engineering and architectural services, supplier of equipment contacts for assistance, parts lists, and many other technical areas, this technician always provided these materials as needed for the benefit of the on-going efforts in process.

The Fiscal and Accounting sections of the GSC were not areas of expertise of this technician; however, in 1984 it became evident that problems existed in the accounting section. In the Third Annual Technical Report, Fiscal Administrative section written by this technician, deficiencies were reported, many being of such magnitude that the personnel presently employed by GSC in those areas were not capable of making the needed improvements. Only after the Consultant, Guy C. Hill, had documented the problems were the defects publicly listed. This is correct procedure; but, this expertise was provided too late to be of value to the project. Projects of this magnitude should have all disciplines covered by experts from the inception of the project to ensure proper development.

C. Advising the Board of Directors

In the initial stages of the organization of the GSC the Technical Coordinator (or Director) was invited to participate in proceedings of the Board's deliberations. This was changed shortly after the present government came to power and People's Defense Committee's established to monitor the activities of foreigners in various national organizations. The Board meetings were "closed" to the technician.

D. Liaison to National Seeds Committee

This was adequately handled by Dr. William Hall, the Seed Testing and Certification technician. The National Seeds Committee existed only as provision of the 1972 Seed Decree and had ceased to function.

E. Liaison with the Ghana Seed Inspection Unit (GSIS)

This technician served for about four years as Seed Testing and Certification advisor to the non-official GSIS, advising Mr. Joseph Turkson, the designated Section Officer, and by providing guidance manuals and materials which were essential to the preliminary efforts of the GSIS.

F. Foreign and Local Training

Participants for foreign training were designated but few proceeded in times of political impasse, or shortages of foreign exchange to purchase air tickets. Not until USAID provided funds did a more definitive foreign training effort succeed.

Trainees were sent to the United States, India, England, France, Nigeria, Kenya, Tanzania, from GSC Management, Processing, Production and Quality Control. Unfortunately no one from Sales or Finance Sections were sent. The Sales Manager hoped to visit some African country such as Kenya or Zimbabwe but there was no funding or program which could be arranged through USAID for this training.

G. Advising on Staff Selection, Placements, and Training

The technician regularly sat on "interview" panels for various GSC positions, but only in areas pertaining to his general expertise or interests.

He provided advice regularly to the Managing Director and the General Manager on re-posting of key personnel where deemed suitable to strengthen weak positions and improve GSC capabilities. Support was also provided to other Experience, Incorporated team members to get more capable GSC personnel on in positions which will have not been adequately filled (Production and Mechanical areas particularly).

MIDAS management was encouraged to send mechanics on foreign training to service GSC's equipment and United States vehicles. This was rejected by USAID. The net result was that the GSC had "some" good mechanics but most were not qualified to work on GSC equipment and needed training. Through persistent efforts, Agri-Mechanic, David W. Johnson, joined the EI Ghana team; but, he came seven years late. He should have been "on the team" from the outset of the project.

It is the technicians opinion that it should not require an evaluation team to recommend or approve changes in a project. The technical assistance contractor and team should be able to command attention, conduct dialogues, and get action on suggestions rather than wait for evaluators which can delay needed action for months or even years. The mark of the best "direction" lies in full cooperation in all matters in the interest of saving time, money, and efforts.

VII. STATUS OF PROJECT AT TIME OF DEPARTURE

Early in December 1985, a decision was made jointly between the USAID Director and the Experience, Incorporated Project Administrator to terminate the service of the technical assistance team by March 31, 1986. Much remained undone and likely will be unsupervised since the technician's counterpart for five plus years, Frederick Hammond, had resigned to take employment outside of Ghana. A long list of incompletes items on the project was prepared and distributed to the GSC Managing Director, the USAID Director, and the Experience, Incorporated Project Administrator. A scaled down "scope of work" was prepared and presented to the above for the remainder of the technician's tour in Ghana. A compilation of incomplete works follows.

Since the GOG had not paid contractors for up to eight months, nearly all construction had stopped at the Winneba project. There was no indication of GOG's resumption of payments to enable contractors to pay labor, buy materials, run equipment, etc. Therefore, accomplishments came to a near standstill in last three months of the technicians contract.

Some of the principal jobs left undone at the end of the technician's tour include:

- o No training on the newly installed rice seed processing equipment in Tamale.
- o No indent cylinders received for the Hart-Carter Indent Cylinder machines installed in Tamale to remove broken rice seed.
- o Dryer wagons and dryer heater and fan units had not been moved from Winneba to Kumasi since construction of a wagon dryer shed had not been started except for digging of trenches for footings.
- o Supervision and guidance of equipment installation and insulation in four of the five seed storage rooms at the Winneba seed storage remained to be completed at the end of 1985.
- o Supervision and ordering of replacement parts will cease unless the Ghana Seed Company finds capable personnel to carry on this responsibility. GSC lost this expertise with the departure of the counterpart, Mr. Hammond, who had six years experience with the technician.
- o There will be only a short period (or none at all) of supervision and assistance at both Tamale and Kumasi in getting electrical components in place and operational.

- o A generator for Tamale and substation equipment for Kumasi had not arrived by end of 1985. Again no counterpart to take over these duties.

An additional three months may have enabled the technician to complete most of the components listed above. The Technical Coordinator Consultant, Chief of Party, regrets any inconvenience caused by his early departure before fully completing work on this seeds project.

A. Unfinished Project Works

1. Winneba New Plant

- o Complete construction of water reservoir.
- o Construct pump house over reservoir.
- o Install two water pumps.
- o Extend electrical works to pumping station.
- o Lay water supply lines around to back side seed storage for chillers.
- o Install fire hydrants and fire fighting equipment.
- o Install stand pipes to front of seed storage and seed processing building for fire fighting use.
- o Extend water supply lines to new workshop now under construction.
- o Complete construction of new workshop.
- o Extend electrical power to workshop and wire.
- o Construct power house to wagon dryer shed (now a fire hazard); present one unsatisfactory.
- o Complete construction on gatehouse (doors, windows).
- o Hard surface entry roadway.
- o Hard surface areas of vehicle useage on site.
- o Construct parking roofs; surface parking areas.
- o Provide furniture, cupboards, etc. to seed sales store and workroom.

- o Make and erect proper signboard at entry by main road. Show details.
- o Erect "GHANA SEED COMPANY LTD" in large green letters on front of headquarters building.
- o Complete service station works including pumps.
- o Prepare fuel storage tank properly.
- o Vapor seal, insulate floor in Room 2 seed storage. Grano screed floor after.
- o To Rooms 3, 4, 5, insulate walls, vapor seal, plaster, insulate and plywood ceiling, paint all walls and ceiling, flat surface floors with proper concrete vapor seal, insulate, grano screed as with Room 2. When Room 1 is vacant, properly insulate and vapor seal the floor, then grano screed floor.
- o To Rooms 2, 3, 4, 5, install and make operational conditioning equipment. Provide materials and parts of United States origin to get all units working since some have been cannabilized for Room 1 units due to malfunctions.
- o Restore replacement parts for chillers, other items (\$15,000 cost plus now).
- o Install proper doors to all seed storage rooms.
- o Block up all rear wall openings.
- o Hook up power to two exhaust fans in seed storage ends.
- o Set up maintenance and repair contracts with ERGS on seed storage and column dryer units.
- o Clear out seed processing store room, construct storage cabinets with locks, widely spaced shelves for bag storage, etc.
- o Remove all workshop equipment from seed processing building to workshop.
- o Erect one complete column dryer which has been lying about the Winneba site rusting and deteriorating. OR SELL IT.
- o Move four drying wagons and air handling drying units to Kumasi via truck.

- o Repair end gates and other parts on all drying wagons and drying units.
- o Await new standby generator, building housing, interconnect to seed processing, seed storage, and headquarters only.
- o Ship entire weighbridge from Winneba to Tamale.
- o Provide support to replace non-functional parts on all site equipment.
- o Set up spare parts order for all dryer and processing equipment. No funding provided by USAID for replacement and spare parts.

2. Kumasi

- o Construct wagon dryer shed.
- o Construct electric shelter to wagon dryer shed as at Winneba (of concrete).
- o Construct sub-station for new transformer.
- o Construct maize sheller/cleaner facility as specified to AESC.
- o Get AESC electrical contract assigned.
- o USAID should purchase replacement sheller/cleaner, Clipper 27 cleaner, drag flight elevator, seed treater, destroyed in fire.
- o Construct 60' x 90' seed processing warehouse. Plans have been prepared by AESC, structural awaiting assignment orders. Urgently needed.
- o Complete conditioning works on present reconstructed seed storage 42" x 80" with installation of condensers, proper sealed doors, vapor sealing walls and ceiling, insulating walls and ceiling with 6" x 20 kg/M3 density styrofoam, which pellets are in storage in Winneba now.
- o Get Electricity Corporation Ghana to bring in high tension power to new substation and make hookups when ready.
- o Clear all electrical goods from port on arrival, check out and transport to Kumasi as soon as possible.

- o Bring to Kumasi from Winneba and Tamale all components for one bucket elevator for use with sheller cleaner facility.
- o Bring to Kumasi all units needed for 60' x 90' warehouse when ready (bins, bins support, etc.).

3. Tamale

- o Complete corrections and modifications to seed processing equipment.
- o Get electrical contract assignment from AESC for electrical works.
- o Connect all previous units into new system to have a consolidated system which is interchangeable with city power when available.
- o Await new generator, construct generator house, connect up to system.
- o Ensure all wiring, switches, starters, are rated according to H.P. rating on all equipment. Must be supervised closely.
- o Build weighbridge and house. Ship all units up from Winneba.
- o After completion of all Tamale works, bring unused items to Kumasi for use with new seed processing building at Kumasi.

4. Ho and Bolgatanga

There are no seed project efforts at either location now. World Bank may get involved at Ho.

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VIII. RECOMMENDATIONS

A. Project Planning

1. A ten year period rather than four years may be required to set all aspects in place on a seed project of this size. USAID should be advised accordingly.
2. Specialist technicians should have been included in the following components:
 - o Fiscal Management
 - o Agri-Mechanics
 - o Seed Processing, Drying, Storage
 - o Seed Testing and Certification
 - o Seed Production Management
 - o Management Development
 - o Sales, Distribution
 - o Marketing Promotion

Not all technicians would be introduced at the outset of the project. Phasing-in should be delineated in the contract.

3. All technicians should have host-country counterparts in position prior to the technician's arrival.
4. Technicians should have decision making powers written into their terms of reference. Without such stipulation, technician's plans may be ignored when essential and productive. Failures to accomplish certain objectives have been due to disregard of the technician's recommendations. If the technician's recommendations are allowed to be ignored, project development fails.
5. USAID should be properly staffed to allow technicians and host country personnel access to project development and management officers. There was a lack of USAID dialogue for much of the year 1985.

B. Ghana Seed Company Ltd

1. Staffing

Weak performers should be reassigned to departments where such individuals are best suited. Misfits should be replaced with competent personnel. Failure to act decisively has resulted in criticism of top management and mediocrity in performances in several key positions. Evaluations have alluded to this problem.

Re-training or upgrade training should be instituted as a stimulus to improvements. Where training yields no improvement the individual should be replaced.

Unfilled key positions in the GSC should be filled at an early date.

Reducing the staff by at least one-half should be an attainable goal by eliminating superfluous positions and combining other positions.

Private enterprise cannot afford unneeded personnel. Redundancy has become a common word in GOG circles. The GSC must determine which staff is redundant and phase out the position or individual.

2. Sales

The lack of an innovative effort was obvious. The lack of initiative was clearly evident at Head Office and Winneba Office when, after ten months of occupancy, the retail sales operation at these locations was not even started. The costs involved could not qualify as an excuse for not getting sales started at these two prime marketing locations.

Expansion of sales efforts must involve the MOA Extension personnel in the rural areas. An effort had been made in 1986 when district extension personnel were starting to assist farmers in obtaining improved variety seeds. More needs to be done by MOA and GSC to rejuvenate this relationship.

3. Product Lines

The GSC cannot survive for long selling maize, rice, and a few lesser volume kinds of seeds. More items must be added immediately. Company management has lagged in organizing an expansion program into other items. The GSC should aggressively sell:

- o Vegetable seedlings (onion, cabbage, cauliflower, pepper, tomato, garden egg, and some other minor items such as herbs, shallot sets)
- o Palm oil seedlings
- o Coconut seedlings
- o Cassava stem cuttings (disease resistant types)
- o Sweet potato seedlings

- o Yam starters
- o Nursery stock (fruits only)

Horticultural specialists must be added as none of the GSC's present staff know much about these products. Unproductive personnel must be terminated to make room these specialists.

GSC should locate sites for nursery culturing near a water supply on non-clay soils, preferably a loamy or sandy-loam soil. Organic matter in the form of composted animal manures would enhance vigorous seedling and nursery stock production. Only improved varieties should be sold.

4. Local Varieties of Vegetables

GSC has been too slow in expanding into seed purchases or production contracting of local varieties of some kinds--hot peppers, tomato, garden egg, okra, onion (Bawku Red).

Instead of exhausting seed supplies, greater efforts should be made for expansion into these kinds.

5. Utilization of GSC Labor

Some reductions in labor forces at most locations have been accomplished. Yet, there is still gross under-utilization of GSC's labor force. No matter what their regular duties might be, there is a tendency to allow many workers to sit around, sleep, or absent themselves for want of work assignments.

Imaginative planning to utilize GSC's available labor on any kind of work is lacking. A lack of direction exists. Greater productivity is a national aim; but the GSC has failed to recognize and correct their inefficient labor practices. Managers and coordinators must have authority to utilize laborers whenever the need exists. Workers should not be led to believe that idleness is routine but rather that it should be eradicated and work habits improved.

A larger and larger share of receipts will go to workers following the GOG announcement of minimum wage at ¢90 per day, up by about ¢60 per day in the last two years alone. This is another reason why the GSC must use its labor force more efficiently.

6. Seed Production by GSC Officials

USAID contracted with Price Waterhouse to evaluate the GSC; they issued a report, dated November 25, 1985. In one summation, this evaluation pointed to the need for making drastic changes in procedures, records, and upgrading of top echelon staff.

The Price Waterhouse Team learned about and openly criticized the Chief Executive and some senior staff for being contract seed growers for the company. This was viewed as conflict of interest and did alienate Winneba farmer seed growers to some extent in the 1985 maize seed harvest season. Only bona fide farmers should be contract seed growers and GSC staff should not be contract seed growers, if for no other reason than to maintain seed grower confidences.

7. Fiscal--Interim Liquidity Problem Solution

For the latter part of 1984, all of 1985, and early in 1986, the GSC lacked operating funds to the extent that a bankruptcy situation prevailed. The MOA/GOG owns the GSC. With them and through them, a solution must be found if the GSC is to remain as an independent company.

Recommendation: For at least the next three years, 1986-88, the MOA/GOG should provide a 50 percent subsidy to the GSC's seeds available for sale to Ghana farmers. Instead of GSC selling maize at 100 pounds for cedis 2,400, GSC would sell 100 pounds for cedis 1,200, thus giving the Ghana farmer incentive to purchase improved seeds. The same would apply to rice seeds for farmers. An alternative procedure would be for the farmer to pay the GSC full price for the seed. The GSC would issue a certificate of purchase that the farmer could present to the GOG for a 50 percent refund. This would put the control with the GOG rather than the GSC.

Ghanians are direct benefactors of increased productivity of food grains. Any such benefits should justify a taxpayer support contribution. Hence, improved seeds would be sold at half the present price and GSC would receive the subsidy to remain solvent.

Revenue Estimates:

| <u>Kind</u> | <u>Quantity</u> (mini bags) | <u>Selling Price</u> | <u>Revenue On-Half</u> (Cedis) |
|-------------|--------------------------------|----------------------|-----------------------------------|
| Maize | 11,800 | 2,400 | 14,150,000 |
| Rice | 6,500 | 3,000 | 9,750,000 |
| Groundnuts | 271 | 2,000 | 271,000 |
| Cowpeas | 38 | 14,000 | 266,000 |
| TOTAL | | | 24,447,000 |

GSC management had started initiatives with the MOA/GOG along these efforts. It is recommended that the program be encouraged by AID as one of the many changes that must be made to save the Company from bankruptcy.

Another Ø6.0M was projected as vegetable seed sale proceeds for 1986. Though Ø30M would not entirely sustain the GSC expenditures and obligations, a beginning would be made leaving room for expansion in seed volumes to be produced in 1986 and marketed in 1987.

8. Call for Donor Support

The GSC has actually operated as a company for about four years (out of slightly more than seven years since inauguration in 1979) during which a new government has been rebuilding the economy of Ghana. The economy, since January 1982, has gradually been resuscitated. Inflation has gradually been brought under control.

The farmers of Ghana, accustomed to the higher and higher prices paid at farm gate during the rapid inflationary spiral period, suddenly became demoralized when farm gate prices tumbled by 500 percent or more in just a few months time in early 1984. The farmers retrenched, within a two to three month period in 1984, planting only a small fraction of their acreages.

Coupled with tumbling farm gate prices were large increases in production costs; land preparation 700 percent, fertilizer 1,056 percent, herbicide 441 percent and seed costs 233 percent (the lowest of all). Farmers withdrew and did not purchase seeds or other production inputs. The effects carried forward in 1985, when surplus supplies of chemicals, fertilizers existed all year as farmers did not go back into production. Farmers just allowed their land to lie idle rather than risk losing everything at such high production costs. Farmers are still waiting for signs or actions by the GOG that will restore their confidence in farming. Meanwhile, the GSC did not sell seed to them in 1985 either and cut their targets for seed needs accordingly.

The developing GSC was caught in these economic developments and had neither the management experience or capital to develop and implement a survival plan. At evaluation time for MIDAS II in November 1985, Evaluators castigated the GSC for its liquidity crisis. Coincidentally, the revelations of deficiencies in the fiscal sector of the GSC were aligned on par with a critical assessment of Management and of the Sales Division, as contributing to the near bankrupt situation.

Yet, the historical record of years prior to 1984 shows a thriving seed enterprise--except for the effects of drought years from 1976-1983--which by November 1985, saw the GSC being "dragged" in almost certain oblivion by Evaluators.

Recommendation: Restoration of confidence in the GSC is called for by the donor. Recognition that GSC must be supported by donor assistance in order to restore solvency must be made known in all circles. Once surfaced, defects in design and operation can be corrected by GSC. Support which was not provided as expected over nearly four years (1982-1985) should be immediately restarted and continued unabated for orderly developments to get back on track for the GSC. Ghana, with its repayment of loans records, deserves support and confidence rebuilding efforts. The GSC is an essential, basic industry, well established, needing gradual restructuring and expansion as a commercial business enterprise for at least another four year period, which was a "lost" time period in USAID support.

C. Need for TDY Technical Assistance - (Follow-On)

If procurement of farm machinery, workshop tools, and seed processing under the loan proceeds TDY assistance is recommended.

1. Agri-Mechanic - 3 months

- o Following receipt of workshop equipment and tools, training in setting up, use of new equipment.
- o Assembly of new farm machinery, training in uses.
- o Maintenance and repair of new farm machinery.

2. Seed Processing Engineer - 3 months

- o Following receipt of new indent cylinders (for rice) for Indent Cylinders machines at Tamale, to install, for running in training.
- o At same time, conduct running in training for the entire seed processing line after electrical installations are in place (generator operational, wiring and switches installed and operational) at Tamale.
- o At Kumasi, install maize sheller/cleaner, cob blower and pipes, erect bucket elevator at sheller, and conduct running in training.
- o If possible, utilize the previous technicians who are familiar with locations, personnel, and objectives.

D. Management Assistance Project Recommended

Format should be developed for a new management assistance-type contract. The previous developments were of the technical assistance-type contract. The new format would be oriented to operations and company management, areas considerably different from MIDAS I and II objectives.

USAID had prepared guidelines a year ago which were shelved pending the final evaluation, a re-study, possibly a design team to develop strategy, goals, and aims.

A United States seed company should be selected to provide the management assistance. A single seed company "Team" is preferred to assembling individuals who had never worked together as a team before. Team members could be more easily replaced or added as needed when from a single seed company, and unity would be more apt to prevail.

E. Replacement and Spare Parts Support

All USAID imported equipment will need replacement parts prior to the end of life use of said equipment. No piece of equipment can be expected to endure without replacement of parts due to normal wear.

Therefore, ongoing financial support for spare parts is urgently recommended on United States origin imported equipment. Previous experiences with a four year \$200,000 funding did reveal that the fund should be about \$60,000 annually for replacement parts. Funding for spare parts will require an additional amount, but all such funding under a loan arrangement, should amount to \$60,000 to \$70,000 annually.

All items imported from the United States should be covered.

USAID should develop a streamlined procedure for all such procurements. Present procedures are cumbersome and slow. Deadlined equipment should not be allowed to remain in that state for more than two months. There is no way to avoid breakdown on anything that is operative. There are ways to shorten the time such equipment is useless until repairs are effected.

F. GSC and Service Contracts

The GSC must invest in a services contract with a reputable, capable Accra firm for the Winneba Column Dryer facility and the Winneba Seed Storage facility equipment. In the one instance, electrical expertise is required. In the other, air conditioning and dehumidification expertise is required.

No one in the GSC has the capability to service, maintain, or repair faulty, broken down items in either the column dryer or the seed storage equipment.

Recommendation: Immediate assignment of service contract is necessary. One firm should be engaged to do both installations. The technician knows one firm which has the capability. The GSC has been advised accordingly.

G. Program for Maintenance and Repairs in GSC

Observations over the tour period show that GSC personnel do not attack maintenance and repair soon enough.

Recommendation: Maintenance must become routine by management insistence. Waiting too long to service and maintain GSC equipment cannot be allowed to happen. Requirements for replacement parts and restoration to proper working condition should be made for every item of machinery at the end of each operating season.

H. Thefts and Fires

Losses due to thefts, especially of electric motors, have become too common in the GSC and represents lax security.

Losses due to fires in two locations have resulted in destruction of more than \$200,000 of United States origin imported equipment. At Winneba, the replacements were brought in by USAID. At Kumasi, the items which were destroyed, along with destruction of structure and other allied GSC owned equipment and facilities, still had not been ordered. Millions of cedi had been spent in rebuilding the burned out structure.

Recommendations: Thefts must be punishable to the extent that watchmen on duty be immediately transferred or discharged as a step toward disciplining for laxity and possible complicity.

Fire fighting equipment and training must be instituted by GSC management. Fire dangers are ever present. Untrained, unprepared personnel are helpless in fighting fires. Lack of fire extinguishers must not be allowed as an excuse for mass fire destruction. Head office and area office management need to develop a fire emergency plan and they must conduct fire drills.

Keys to warehouses at Tamale are carried from the GSC compound by the storekeeper to his home. In the event of a fire inside Tamale's warehouse, there are no axes or other means to breakdown the door to get into the warehouse. No fire drills had been conducted when inquiry was made. The building has electrical wiring which is often the origin of destructive fires. Remedial action is long overdue.

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GHANA MIDAS II SEED MULTIPLICATION PROJECT
PROJECT NO. AFR-0102-C-00-2003-00

END-OF-TOUR REPORT

Sheldon Sandager
Seed Production Management Specialist
February 1, 1982 to December 31, 1985

I. INTRODUCTION

This Seed Production Management Specialist arrived as a member of the Experience, Incorporated team on January 30, 1982. The scene was the beginning of the MIDAS II phase. The assignment with the Seed Multiplication, one of the six technical sub-components of the MIDAS project, was set forth under Contract AFR-0102-C-00-2003-00. The technical services contract was developed and made effective January 1, 1982, with a termination date of September 30, 1984; however, an extension of the contract was negotiated until the end of December 31, 1984.

Considerable project development remained unfinished at the end of 1984 due to long delays in procurement and delivery of equipment, parts, and supplies. The Experience, Incorporated contract was amended on February 28, 1985 to extend through March 31, 1986. This Technician agreed to extend his contract for an additional 12 months in order to complete the 1985 seed production year.

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II. ASSIGNMENT

A. Objectives

- o Improve the production of foundation seed on company farms.
- o Use foundation seed for contracting certified seed production through a system of contract growers.
- o Develop the capacity within the Ghana Seed Company (GSC) to provide sufficient quantities of improved varieties of seed for Ghanaian farmers at a reasonable cost to enhance their productive capacities.

B. Scope

- o Assist the GSC in training personnel for the overall management, budget preparation and operations of the production section.
- o Assist in mechanization, maintenance, and training of the GSC personnel for the production section, as well as training for the private sector cooperators.
- o Train GSC technicians in overall field management and in responsibilities of seed farm layout and development, crop rotation, isolation requirements for specific crops, certification guidelines and disease and pest control procedures.
- o Encourage maximum involvement of the private sector in the production and marketing of seed.
- o Participate in the selection of staff for in-depth professional training, operational technical training, and on-the-job training in disciplines related to seed technology, plant pathology, plant breeding, and agricultural engineering.
- o Assist in the improvement of communication between extension personnel and the farmer through recently updated seed multiplication media.

C. Duties

- o Assist the Ghana Seed Company Production Division in fulfilling foundation and certified seed production requirements.

- . o Assist the area managers and the foundation managers to develop comprehensive farm and management plans.
- o Supervise the major production operation of the foundation seed farms and most of the contract seed growers.
- o Assist the Production Division in soliciting eligible contract growers for certified seed production.
- o Assist with the verification of contract areas planted and harvested.
- o Assist the foundation seed farm managers and contract growers with the logistical problems of receiving input and delivering produce to processing centers.
- o Coordinate seed production schedules with Quality Control Division and harvest schedules with the Processing Division.
- o Supervise procurement of machinery and proper assembly of same.
- o Prepare emergency orders as required for production machinery and transport vehicles.
- o Prepare annual orders for machinery spare parts, tires, batteries, and expendables.
- o Assist in receiving and inspecting of USAID-procured commodities for GSC Production Division.
- o Assist with the dispersion of USAID-procured commodities to their respective areas.
- o Monitor and account for USAID-procured commodities, inspecting condition and usage.
- o Prepare fertilizer and herbicide annual requirements.
- o Attend weekly, annual, and semi-annual seed grower meetings as well as other GSC/USAID required meetings.
- o Prepare and submit on a timely basis, weekly reports, trip reports, special and annual reports.

III. WORK PLAN

A. Assignment of Counterpart

Mr. Peter K. Poku, the Production Technical Coordinator, was assigned as counterpart to the technician. Mr. Poku previously served under the Ministry of Agriculture (MOA), Seed Multiplication Unit (SMU), and continued on when the GSC was inaugurated on August 14, 1980 and became a parastatal (a private company owned by the Government) as of September 1, 1981.

Mr. Poku accompanied this technician on visits to the 12 foundation seed production farms deployed in the five regional areas. In addition, throughout the growing season the majority of the 170 contract seed growers were visited on their farms.

As counterpart, Mr. Poku assisted with the overall farm planning and training of farm managers and support staff (mechanic, machinery operators and farm workers) on the foundation seed farms.

During the mid-year review meeting, August 1984, the managing director declared a three year state of emergency due to the low liquidity status of the Company. Four of the Divisional Managers were redeployed as Coordinators under the General Manager's office. This action confined Mr. Poku, for most of the time, to the Accra office where he was active in procurement of inputs and dispersing them to the respective regional branches. Because of per diem expenses of overnight and traveling, Mr. Poku was allowed to attend only some of the special area functions with permission from management. This limited Mr. Poku's on-farm visitations to mainly the close-by Winneba and Ho areas. In areas where he could not accompany, the area managers or staff members would assist with the farm visitations.

B. Supervising Work on the Foundation Farms

The regional areas were visited during the pre-planting season. Comprehensive plans were developed for cropping plans, field rotations, and farm input requirements that were needed to fulfill foundation seed production targets.

Soil conservation practices were needed. Contour terraces and waterways were designed and constructed where severe soil erosion had previously taken its toll.

Mechanics and operators were supervised in pre-season servicing and preventative maintenance of crop production machinery.

During actual field operations farm managers, mechanics and machine operators were advised on the technical aspects of mechanized farming and the following stressed:

- o Safety rules in operations;
- o Fundamental operation of the various machines;
- o Trouble shooting, recognizing and diagnosing malfunctions of machinery performance;
- o Work planning for more efficient use of machinery in the field; and
- o Timely performance of field operations.

Isolation requirements for the different varieties were strictly adhered to and adjoining farms were furnished seed of the same variety to prevent any chance of cross-pollination.

The proper use and safe handling of herbicides and pesticides were demonstrated. Farm managers and operators were shown how to calibrate field sprayers and use pesticides according to manufactures' labeled product recommendations.

Crop development during growing season was closely monitored noting fertilizer deficiency symptoms and insect infestations. Off-type plants were thoroughly rouged to maintain varietal purity.

During harvesting operations there was close supervision of seed handling and hand sorting. Activities were coordinated with the Quality Control Division to insure delivery of high germinating seed to the processing centers.

C. Supervisory Work with Certified Contract Seed Growers

The technician worked together with his counterpart in recruiting, selecting, and determining eligibility of contract seed growers for certified seed production.

Numerous farm visits were made to growers farms during the season offering agronomic advice and assisting in the following:

- o Overall farm management
- o Machinery problems, adjustment of tillage equipment, selection of seed plates on planters, calibration and settings on field spraying equipment, maintenance, servicing and proper use of equipment

- o Use of improved technology, recommended fertilizer rates, proper plant density, weed control, and use of pesticides
- o Recognizing and rouging out of varietal off-types before harvest
- o Timely harvest
- o Proper sorting and handling of seed during harvest
- o Coordinating seed delivery with Quality Control and Processing Divisions

Attended seed growers meetings in the different areas when negotiations were made with the Company for pricing and delivery of seed.

During the assignment, visits were made to all the regional branches especially during peak seasons and harvesting. The contract period required an overall travel of 120,000 miles, often over difficult roads. It is estimated that over one-third of the technician's time was involved in traveling to visit the foundation and seed grower farms.

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IV. IMPLEMENTATION - ACCOMPLISHMENTS

A. Foundation Seed Farms

Basic seed production data for 1985, by area, is shown in Table A-1, Appendix A. The production for 1982-1985 is shown in Table A-2, Appendix A.

1. Winneba Area

a. Okyereko Farm. During the first year's cropping season, 1982, observations were made that a severe erosion problem existed on this farm. Because of its location in the hilly coastal area where the bush has been cleared, the fragile soil profile left is subject to micro channel or rill erosion. Where there is excessive concentration of running water, severe deep channel or gully erosion was occurring. Eventually it would have become impossible to farm with machinery thereby destroying or making a large tract of land unusable. Flooding occurred in the low lying areas and the farm road was impassable.

Reclamation and preventative practices were analyzed for a comprehensive soil conservation with a reclamation plan. A topography map of the farm was made with the cooperation of the Irrigation Development Authorities under the MOA. Major mechanical protection had to be adopted in the form of channel terraces which were built on contour lines with a slight grade which discharged into water courses. These were grassed to control runoff of excess water. The farm road was regraded and gravelled into the farmstead, culverts installed, and a ditch made through low lying areas to improve drainage. The plan was initiated in the 1983 drought season when only twelve inches of rain fell during the major growing season. When rains returned in the 1984 crop season, the channel terracing and contour farming methods performed well in controlling the runoff. The lowlands suffered no appreciable loss from water-logging as in the past. Unseasonable heavy rains at harvest, coupled with the farm manager's delay of harvest, resulted in a severe loss situation. Much of the crop was lost due to stalk lodging and termite damage. Redeployment of the farm manager was recommended. Under the new management of Emmanuel Oduro in 1985, the farm showed marked improvement and seed production more than doubled over the prior year.

The newly released variety, Tuxpeno, an early maturing (110 day) maize variety, outyielded the composite IV normally produced on the farm. This short plant height variety has created considerable interest among growers in the area. The thirty acres of Tuxpeno harvested 315 bags (220 pounds). The composite four yielded 396 bags which boosted total production to a total

of 711 bags from 90 acres of harvested maize. During the minor season, the TVX 18 43 Variety of cowpeas was planted on 9 acres. A yield of 14 bags (140 lbs.) of seed was obtained.

2. Volta Region

a. Asikuma Farm. This foundation farm has been virtually nonproductive, left mostly under fallow in order to regenerate. Light and sandy soils are subject to drought. Erosion was severe under heavy rainfalls which occurred this year. For the past two years limited acreages of the 90 day, TZSER variety maize developed at IITA, Ibadan, Nigeria have been grown in isolation on this farm. The production has been reasonably good for the short season, streak resistant variety. The demand is good for early maturing varieties used for early green cob roasting and for the minor season production when the rains tend to be short. The farm had a production of 158 bags of TZSER maize seed during this year's major season, with another five acres to be harvested at the end of the minor season. The minor season's production is ready to harvest and looks good, estimated to yield 12 maxi bags.

b. Logba Farm. This foundation farm is located in a good productive area and has an excellent sandy clay soil. The farm has the advantage of moisture holding capacity in dry seasons; however, successive rainy days can prevent harvesting the crop on schedule. The crop lodges badly, making harvesting difficult, resulting in a relatively high percentage of spoilage. When major season rains are abnormally heavy, yellowing occurs in waterlogged swamp-like areas where drainage is not possible.

The 1985 season had an unusually dry period during April and May. The early planting (April 10th) of 50 acres of Ejura 7843 and 13 acres of Safita II (April 25) were severely retarded by drought during tasseling time and silking stage. The 25 acres of La Posta planted on May 8th performed well as heavy rains in early June occurred and continued throughout the season. Rains occurred almost daily throughout the harvest period. Rainfall was recorded twenty days of the month during harvest time. Total seed that could be salvaged and delivered to Winneba for processing was 290 bags (Maximum 220 pounds) from 81 acres. The Lobga manager and workers are to be commended for their diligent work under the adverse harvesting conditions. Without their considerable effort, more seed would have been lost.

3. Kumasi (Ashanti and Brong Ahafo Regions)

a. Kwadaso. Located at the site of the GSC regional office and having been farmed continuously for the prior 20 years, this farm has been lying fallow for the past three years, with the exception of a few plots in the low lying ground used in isola-

tion for the initial increase of newly released breeder seed. This seed was obtained from the CRI-CIMMYT-CIDA Grains Agricultural College, Kumasi.

The Soils Research Institute of the Kwadaso Agricultural College has been soil testing and running research experimental plots to determine deficiencies and recommendations. Soil tests conducted by Mr. Dennis from the Soil Research Institute (SRI) at Kwadaso Agricultural College, Kumasi, indicate acid soils with the tests in the low pH range of 4.0 to 5.0. Ideally for maize production, it should be in the neutral range 5.5 to 6.5 pH. Organic matter (2.1 percent) and phosphates were also found to be low. Oyster shells were used in the experiments to provide calcium to correct the acid condition. Limestone is not readily available and oyster shells are expensive. Another source of calcium has been located--the waste carbide product from the acetylene gas production from L'liquid Air production plant at Tema. Dr. Layrea from the Soils Department at Legon University, Accra, is presently determining the proper rates of the by-product to be used in order to neutralize the soil.

Three small quantities of breeder seed released by the CRI Kwadaso Agricultural College, Kumasi, were increased in isolation plots resulting in 20 bags of seed to maintain the three variations of La Posta (New Improved), Ejura 7843, and Golden Crystal. These experimental plots were successfully grown under the no-till system recommended by IITA, Ibadan, Nigeria as a farming system for use in tropical soils to produce good sustained yields. The plough and disc harrow are discarded and crops are sowed directly into untilled land. Only the grass is slashed and the no-till system uses herbicide to control the weeds. The mulch minimizes the direct impact of rain and replenishes organic matter. Hand weeding was done at four weeks after planting. It appears that this method has much merit in delaying the breakdown of crop residue and sustaining moisture and soil productivity under the heavy rainfall conditions of the tropics.

Five acres of cowpeas were planted in the minor season using the same method. They appear at this time to have an excellent yield potential.

b. Ejura. Located in the transitional zone, this 120 acre farm has a sandy loam soil. It has a continuous crop production history dating back to the period when it was farmed under the Ministry of Agriculture. The lighter sandy areas are very low in organic matter content and crops are subject to distress during short drought periods. The farm has a severe infestation of nutsedge which cannot be controlled by the herbicides presently available in Ghana. This consultant listed the specifications for the herbicide "Sutan" to be brought in by our commodity procurement system under the Revised Implementation Plan of 1982.

The Chanex International commercial maize production farm at Ejura has reported successful control with this product and CRI Grain Board experimentally substantiated that nutsedge can be controlled by Sutan herbicide in their experimental plots adjacent to the farm. The Revised Implementation Order for this herbicide was not forwarded for procurement. Unless this problem can be resolved, production on Ejura farm cannot be sustained even at its present low level and will have to be abandoned as uneconomical.

Production for 1985 looked promising when the rains started early, providing good growth the first five weeks after planting. An unusually early dry period during the month of May caused severe stunting of the mid-March and early April plantings of maize that had tasseled during this drought period. Twenty acres of the improved La Posta (released last year as breeder seed) produced only 20 bags of seed. The later May plantings fared somewhat better bringing the total production of La Posta varieties to an estimated 200 bags. Five acres of cowpeas appeared to be in excellent condition with harvest only beginning at the time of this report.

4. Tamale (Northern Region)

a. Nyankpala. This foundation farm (65 acres) has experienced deterioration of soils during successive years of production. The major portion of the farm has been left fallow to generate in organic matter and fertility. Twelve acres have been used for maintenance and increasing three varieties of maize (Golden Crystal, Composite W and Tocumen) yielding a total of 68 maxi bags. Three acres of groundnut varieties (Chinese, Manipinta, and Samaru 38) yielded 17 bags (80 pounds) of seed.

b. Damongo. With the scaling down of production at the Nyankpala farm, a new foundation maize seed production farm was selected in the good maize production area near Damongo. The area has the advantages of generally favorable rains, good silty clay loam soil, and favorable natural drying conditions in the field. The Composite-4 variety, planted on 42 acres, was ready to harvest with a projected yield of 250 maxi bags. Five acres of Chinese groundnuts are estimated at 13 bags. Yield potential was greater, but at harvest time the ground was too wet, causing the rotting of seed in the ground.

c. Nabogo. The land is fed primarily by rainfall and the fields bonded to retain the runoff from the drainage area. It has the advantage of quick drainage when the ditches are open prior to the harvest. The early maturing varieties of rice can be produced at this location which allows for earlier harvest operations with the combine. The farm had good production in 1985 with a yield of 808 bags (180 pounds) from 106 acres of three varieties (IR8, IR5, and Farrow 15).

d. Salega. The area of Katanga flood plains is more suitable for the longer maturing varieties of rice. During heavy rains of this year the river backed up and overflowed its banks. The lower 25 acres close to the river flooded out. The adjoining areas of the flood plain had good coverage of water. With its rich silt deposits this was a very productive area. In December 80 acres had been harvested yielding 800 bags (180 pounds). Fifty acres remained and the projected yield was 1,260 bags for the total 165 harvested acres.

5. Bolgatanga (Upper Region)

a. Gbedembilsi. Located in the productive Fumbisi valley rice producing area, this farm (75 miles distance from Bolgatanga) was obtained in 1984 after successive failures in several locations in the upper region. An unusual drought occurred and the farm produced only 432 bags from 200 acres. This year heavy rains occurred and roads to the farm were inaccessible due to flooding conditions.

Of the 150 acres planted to two varieties (IR8 and 3273), 30 acres were lost to wet conditions. From the remaining 120 acres, a projected 1,200 bags (180 pounds) of rice seed will be produced.

b. Namongo. This small acreage, located near Bolgatanga, utilizes labor from the processing plant for the production of Chinese Florispan groundnuts. Hard dry ground prevented completion of the harvest resulting in only 13 bags of seed from the 6 acres planted.

B. Certified Seed Contract Growers

Certified Seed Production Data for 1982-1985 is shown in Table A-2, Appendix A. Production data for the year 1985, by area, is shown in Table A-3, Appendix A.

The performance of contract growers for the Ghana Seed Company is to be commended when one takes into account the complexities they have encountered throughout the four-year period. They faced macroeconomic and political factors over which they had no control. In addition, growers in some areas experienced three successive years of drought.

In the 1984 growing season the rains in Ghana returned to normal, resulting in a bumper harvest. In the major producing areas of the transitional zone in the Brang Ahafo area, maize prices at harvest time were at distress levels commanding only 500-600 cedis per maxi bag. Some of the crop was left to rot in the field as cost of harvest and transport to the market exceeded its value at the marketplace.

Seed prices to growers for the 1984 crop production was lowered to 2,000 cedis per bag. In projecting their needs for 1985 sales, area managers had to establish quotas for purchase of certified seed due to large carryover stocks.

Low liquidity in the GSC finances limited complete payment to growers for seed delivered to the Company. Growers were paid a down payment upon delivery of seed, with a promise of the balance at the time of seed sales in 1985.

Maize seed selling price for the 1985 planting season was pegged at 4,800 cedis per 200 pound bag. Sales volume again was very poor and 1985 seed sales income was dismal.

At the mid-year review meeting, August 1985, the sales and distribution manager is quoted: "The dismal performance arose mainly because of the following:

- o Because of grave liquidity problems facing the farming community as a result of the previous successive poor harvest that the farmers had to contend with, the liquidity base of the industry was completely eroded. This problem was further worsened by the reluctance of banking institutions to advance credit facilities to the farmers mainly because of the farmers inability to repay the loans granted them for the 1984 "bumper" crop.
- o Disincentive or lack of incentives accorded our food crop farmers, especially maize and rice farmers. The government's controlled price was far below the breakeven point for the successful operation of the maize crop industry in particular. The farmers were therefore apathetic to the whole idea of going into an industry prone to financial embarrassment.
- o The very late onset of rains in the northern and upper regions prevented most farmers from going into rice and maize cropping this season.
- o The sociological syndrome of the seed industry itself. The Ghanaian farmers are not as of yet conditioned to the improved seed technology. Most, if not all, farmers in the country are not prepared to patronize quality seed at economic rents. Without subsidizing prices of improved technology agricultural inputs for the next five years, during which time the farmers perception of improved seed technology would be re-oriented, the future of the seed industry is really very bleak."

Area manager, Tom Bonney, had the following report of sales at Kumasi at the mid-year review meeting: "In the traditional maize growing areas like Techiman, Nkorenza, and Mampong, farmers had switched from maize to tobacco and vegetables. For the first time in the history of the area, the Mampong alone had sold over 3,000 ounces of carrot seed. This exceeds the total carrot sales for the area for the past three to four years."

Company management at the mid-year review meeting maintained that the two year seed sale slump will reverse itself. There is a likelihood of resurgence of the true value of maize next year as a result of an anticipated low production of this year's crop. Again quotas were set for the purchase of this year's seed from the contract growers. The base seed purchase price was established at 2,200 cedis per maxi bag.

A forty million cedi loan for purchase of last season's maize could not be repayed due to this year's poor sales performance. The balance of payment due to the growers also could not be paid. In spite of this the seed growers displayed sustained support and a remarkable vote of confidence in the Company by delivering most of their quota on credit, without complete repayment of the balance due to them from the previous year's production.

1. Winneba Growers (Central Region)

Thirty-six growers signed 2,000 acres for this year's projected production of 6,820 bags. The quota established for the Winneba area was 1,500 bags. A projected 1,000 bags will be delivered.

The production along the coastal area was very good this season with many yields averaging 9 to 10 bags per acre. The farm-gate market price slumped at the beginning of harvest to 1,200 cedis per bag (bush weight approximately 240 pounds) at the end of August. By the end of September, prices had escalated to 1,400 cedis per bag. In October it climbed to 1,600 cedis and then reached 2,400 cedis in November, when the harvest glut was over.

On August 15, at the beginning of harvest, GSC management met with the Winneba seed growers to determine the base price for seed. Realizing the low liquidity in the system, alternative plans were designed in order to insure seed for an anticipated rise in demand for next year's seed sales, and also as a favor to the growers to offer the chance to fully utilize the capacity for the new processing and storage facilities now completed. Three options were proposed to the contract growers:

- o The quota of 1,500 bags would be guaranteed a base price of 2,200 cedis. In addition a bonus would be paid if the demand for seed commanded a price above last years seed price (4,800 cedis).
- o A stand-by reserve seed program would allow growers to deliver additional amounts above their quotas to be handled as seed and held in case stocks on hand were insufficient to meet the anticipated increase in sales volume.

The grower would be charged a handling fee of 1,000 cedis per bag to offset actual costs of hauling, storage and processing.

- o In order to fully utilize the plant, growers could use the plant on a custom service basis. Their maize could be dried and stored for the regular market for a fee representing cost of drying and storage for the actual time used.

At first the growers began to deliver on their quotas, but as the season advanced prices offered by the poultry feed manufacturing sector and maize buyers from Accra approached the base seed price. The fast advance in the market offered a better alternative for some of the growers since GSC could not pay in cash. Many of the growers demonstrated in good faith their loyal support to the Company by still delivering seed maize on a credit basis although payment was still in arrears on last year's seed.

2. Ho (Volta Region)

Four growers signed 220 acres. Projected production was 1,100 bags. The quota established per harvest was 280 bags. Only the Hillcrest farms are expected to deliver 100 bags.

Seed growers' interest was practically nil during the early 1980s; however, there has been a continuous growth in interest and participation. This has to be curtailed as the regional headquarters at Ho does not have drying and processing facilities. The grower's production has had to be transported 120 to 130 miles to Winneba. When the farmers are harvesting load lots for haulage to Winneba, time lapses lead to deterioration of seed quality and viability.

Rainfall has been reliable and production good in this area. The potential is favorable for future development and expansion.

3. Kumasi (Ashanti and Brang-Ahafo Regions)

Only twelve of the twenty-one contract seed growers expressed a desire to produce certified seed for the Company. Most growers give the low liquidity problem resulting from last year's low prices as an excuse not to crop. Twelve seed growers signed 960 acres, projecting 500 bags production. The quota for delivery was 200 bags with five growers expecting to deliver 100 bags.

There has been limited capacity for drying, shelling, processing, and storage for contract grown seed maize in the Kumasi branch, due to a fire which damaged the entire facility in 1983. Attempts were made to transport seed maize from the growers' farms, which is a 70 to 80 mile distance to the regional headquarters at Kumasi and then another 190 miles to Winneba. The time lapse resulted in excessive loss of seed quality and viability and the practice had to be discontinued.

4. Tamale (Northern Region)

Twenty-five rice growers signed and were supplied with 320 bags of foundation seed. They achieved 760 acres for potential seed production. The target quota was 4,000 bags (180 pounds) to be purchased.

The government, MOA, has announced a government price support for rice at 2,000 cedis per bag (bush weight 200 pounds). The Nasia Rice Production Company was offering 2,000 cedis per bag (180 pounds). Seed growers were completely reimbursed for last year's seed, but were reluctant to deliver seed this year on a credit basis. The Tamale branch can only finance an estimated 1,000 bags. Negotiations were in process with the growers on the base price of seed to be purchased. Under consideration three was a seed reserve storage program to growers to ensure seed supplies for next year. The rice growers were getting good production and reported 10 to 15 bags per acre. There appears to be a degree of optimism among the growers who have had, for the first time in the past three years, a good crop and generated some capital with which to expand production again. The government price support at harvest time is encouraging for production; however, this price support makes it difficult for the Company to purchase at a price where the necessary margin can be obtained for processing and handling.

Farmers are reluctant to pay higher than market price for certified seed as some of the larger producers hold the second generation seed produced from certified seed and sell at planting time in competition with the Company's certified seed.

5. Bolgatanga (Upper Region)

Only seven growers obtained rice seed for planting. The rains were late in their arrival and at the onset became very heavy. Growers were not able to get their lands prepared because of wet fields. Only one grower succeeded in planting seed on 20 acres. This field had not, as yet, been harvested. It remained unlikely that the 300 bag quota would be filled as no financing is provided.

The Bolgatanga branch had no quota for purchasing maize seed as stock is well supplied from last year's carryover.

No foundation maize seed was taken for planting. The maize production area is 150 miles distance in the western upper region. This make it difficult to supervise contract growers, and transportation for certified seed production is expensive.

C. Farm Chemicals

1. Fertilizer

Compounded starter and nitrogen sidedress fertilizers were used on all foundation seed farms at the recommended intermediate levels which showed the greatest return on investment. This was based on numerous field trials and verification plots throughout Ghana maintained by the CIMMYT-CRI, Grains Development Project at the Kwadaso Agricultural College, Kumasi. Soil samples were collected on the foundation seed farms to check the fertility pH levels. The samples were tested at the Soils Research Institute (SRI), Kumasi; the Soils Department Legon University, Accra; and the Kpong Agricultural College Research Farm.

Fertilizers were imported and obtained through the University of Agriculture. Supplies were erratic and in 1982 they arrived after the planting season was over. The latter part of the project period saw an adequate supply on hand as district warehouses began to fill. Farmers refused to pay the high cost (tenfold increase) of fertilizer and put in the crop with the least cash outlays.

2. Herbicides

In the first year a PIO/C order of USAID supplied pesticide arrived. This augmented the shortages in the system from the dealers at that time. No herbicide specifically for the control of nutsedge (*Cyperus rotundus*) and rottboelia was available. In the revised implementation plan the herbicides Sutan and Stomp were ordered for control of these two serious weed pests.

The order was not forwarded for procurement as AID funds were suspended for many months because of political reasons and unsigned contracts for the project extension period.

Tank mixes of Lasso and Primagran were effective in controlling most of the weeds early in the season. It would have been beneficial to supplement the application with one cultivation. It was unfortunate that the inter-row cultivators on PIO/C orders in 1982 never did arrive as they had been misdirected by the Procurement Agent to other countries and were never recovered. Labor costs for hand weeding is prohibitive. Without the use of herbicides, production would have been disastrous.

The Round-up/Lasso/Atrazine combination was very effective on the zero tillage experimental plots, where breeder seed was being increased at the Kwadaso Farm in Kumasi. The tall grasses were merely slashed and sprayed with the mixture, and maize was planted in residue mulch left on the surface. This farming system was developed and recommended by IITA, Ibadan, Nigeria as a method to maintain soil fertility under continuous production in tropical conditions.

3. Insecticides

Throughout the contract period, pesticides were supplied by USAID supplementing the local supplies. Negligible quantities of insecticides were used for the maize production. Only small quantities of Furidan were used to control stem bore infestations during the minor season production. Acctellic, locally available, was used on cowpeas during flowering and seed formation stages.

D. Training

1. Training of Counterpart

Mr. P.K. Poku, counterpart production manager, throughout the project period, traveled with the technical consultant. The main scope of work was close supervisory on-the-job training of farm managers and operators of farm equipment. At the Winneba Okyereko Farm, a totally new concept of contour farming required a great deal of training of management and equipment operators during in-field operations. Mr. Poku learned how to lay out contour lines with the aid of a hand-site level. Practice was done on one of the participating contract grower's farms.

2. Training Workshop

In May 1983, a week long training workshop was jointly held for production and quality control management personnel at Bolgatanga. Twenty-five junior and senior GSC divisional officers attended. Papers were presented after which discussion periods followed on topics listed below:

- o Quality control, seed formation, development and maturation
- o Seed production and breeding
- o Farm machinery and implements
- o Seed growers administration
- o Safe handling of pesticides
- o Good farm management practices
- o Role of quality in seed business
- o Seed processing/mechanical adaptations, labor management, record keeping
- o Basic seed cleaning, grading, and screen selections
- o In-field demonstrations for each department

3. Hands-on Training Centers

This year's financial constraints prevented regional branches from getting together for a joint workshop training session.

With the completion of the new Winneba processing plant, a short-term specialist, Dr. Paul Mezynski, was brought in for start-up and training of personnel for operations. The production division was invited to participate in a three-day hands-on training session. A demonstration center was set up to show how the proper seed plates were selected to conform with the various seed grades and sizes. Corn planter units from three different manufacturers were mounted on a frame to simulate actual planting conditions. Planting accuracy could then be compared when the various plates were used on different seed grades.

4. Participant Training (USAID Funded)

Three trainees from GSC participated in the Seed Improvement short course sponsored by USAID and Mississippi State University, June to August 1985:

| | |
|-----------------------------------|-------------------------|
| Cletus Achaab, Production Officer | - Tamale Branch |
| Thomas Adjai, Production Manager | - Logba Farm, Ho Branch |
| Kofi Abunyewa, Processing Officer | - Kumasi Branch |

E. Training Personnel on Farm Equipment

In September 1982 a three day training workshop was held at Kumasi for orientation on the newly received International Harvester IH 3288 tractors. Eighteen operators and mechanics from the five regional branches received instructions and training covering the following subject matter:

- o Basic principles and functions of the hydraulic, electrical, engine, and cooling system
- o Preventative maintenance and periodic servicing
- o Safety and familiarization of instruments and controls
- o In-field demonstrations on proper use of draft-control and settings of plow operations
- o Individual participation of operators to check out driving and handling of the larger 95HP tractor

In August 1983 another hands-on training, two-day workshop, was held at Kumasi, and repeated at Tamale in order to accommodate the large number of (48) participants.

Production officers, mechanics and all machine operators attended and participated in the hands-on training sessions pertaining to:

- o Basic functions of the major component parts of the tractor and combine care and servicing
- o Preventative maintenance
- o Individual participation of operators and mechanics doing settings of plows and disc harrows in the field

Due to financial constraints of the Company in 1984, expenses of per diem and transportation were too costly for bringing Company personal together as in previous years. Training was provided on the respective farms. Specific on-the-job training was done on the farms with participation of machine operators and mechanics.

At the Winneba and Asikuma Farms the mechanical maize pickers were started. Mechanics and operators were given on-the-job training for operation and care of the machines. Farm management was taught how to evaluate field losses behind machines and compare the efficiency to hand harvesting.

At the company branches of Tamale and Bogatanga, the rice combining season was used for in-field training on proper combine settings.

During planting seasons calibration of field crop sprayers and seeding equipment was demonstrated.

Hands-on training sessions were conducted in the field during rice harvest season at Tamale and Bogatanga. Platform auger and reel adjustments were taught under adverse conditions of down grain. Operators practiced troubleshooting and correction of faulty settings. The production manager and field assistant learned to evaluate field losses and determine corrective measures.

These practical in-field training sessions proved most effective in teaching the technical aspects of machine adjustments.

F. Training of Contract Growers on Use of Farm Equipment

Contract seed growers had limited experience in maintenance and operation of machinery used in their farming operations.

Custom-hired service operators also were untrained, careless, or in haste to get the job done, paying little attention to the quality of service they performed.

The dealers who sold the farm machinery packages were negligent in the proper assembly of equipment. Hitches were found mounted upside down on planters. Chains were inverted and running in reverse directions. Bolt fasteners were not firmly tightened resulting in further component damages to the machines.

Operator manuals were seldom furnished with machines and if provide done, the technical information was not fully understood or comprehended.

During the technician's farm visits, growers were given technical advice on operational settings for field equipment. They were taught preventative maintenance and regular servicing and lubrication of their equipment. This resulted in fewer breakdowns in the field and longer life of the machinery.

One of the most frequent problems encountered was calibrating the proper planting rates and selecting the correct plates for seed size on their maize planter units.

During the hands-on training session held at Winneba in 1985, the area contract growers were invited to attend a seed plate selection demonstration with model corn planter units. They were encouraged to bring their own seed plates to observe the processing machine size the seed to fit their own plates. This exercise should greatly improve the plant population densities of the maize fields in that area. Both the processing personnel and the growers have a greater understanding of how and why seed is graded for size for more accurate planting.

V. CONSTRAINTS

A. Outside Factors Affecting Production

Macropolitical and economical changes brought about constraints outside the immediate control of the GSC and Experience, Incorporated field team.

The change in government leadership and reorganization as a result of the December 31, 1981 revolution caused disruptions in the supplies of inputs. Machinery, diesel fuel, fertilizers, herbicides and other farm inputs were sporadic and in short supply. Untimely deliveries of the commodities meant carrying over the supplies to the next year.

In compliance with the International Monetary Fund economic policies, the overvalued cedi was rapidly devalued. In effect, this brought about a dramatic increase in costs of the imported inputs. The basic Massey-Ferguson farm machinery package rose in cost nearly 20 times from 105,000 cedis in 1982, to 2 million cedis in 1985. Other costs of farm inputs of fuels, fertilizers, herbicides and insecticides increased at least tenfold.

Initially government price controls were attempted, then abandoned when shortages and unofficial markets resulted. The drought conditions experienced in 1982 became even more severe the next year. Starvation was imminent when a sudden influx of over one million refugees were repatriated from the neighboring state of Nigeria. Unrealistic prices soared in the unofficial market during the planting season of 1983. Seed demand was unlimited when the government price of maize seed was set at 1,800 cedis per bag (200 pounds). On the unofficial market it would command a price of 12,000 cedis per bag. Due to drought encountered during the production season, fierce competition developed for the contract seed growers' production. In order to ensure adequate seed supplies for the coming year, the company paid 5,000 cedis per maxi bag to the growers.

In the rice production areas of northern Ghana, the shortage of the crop prompted USAID to assist with the importation of 160 metric tons. The certified rice seed or proven varieties arrived from the Philippines by air freight.

In response to the government's appeal to the international donor agencies, excessive quantities of grain and seed arrived at the beginning of 1984. This had an immediate demoralizing effect on the grain market. Ghana Seed Company had purchased certified maize seed at 5,000 cedis and priced the seed at 10,000 cedis per bag (200 pounds) to recover costs. Seed sales were generally poor. Ghana Seed Company was able to market only

30 percent of its maize seed, less than 40 percent of its rice seed, and less than 15 percent of its groundnut seed. As a result, germination of most of the balance of seed stock began deteriorating and was sold as food at drastically reduced prices.

As stated in the 1984 mid-year report from the Company's division distribution manager, "The understated factors accounted for the sorry state of affairs:

- o The generally low liquidity ratio in the monetary system
- o The inability of the banking institution to advance credit facilities to the financially dehydrated commercial farmers
- o The generally high cost of complementary inputs
- o The influx of free seed from donor agencies through Christian consul and other religious organizations
- o The general despondency of the majority of commercial farmers who suffered three continuous droughts

The net result for the farmer not to overextend himself was that very small acreage was cropped and the multiplier effect is the negative coefficient of the correlation in aggregate demand for seed."

When the country finally recovered from the drought in 1984, farmers were financially dehydrated. Lending agencies did not advance credit. Farmers were reluctant to plant maximum acres of grain crops due to the high cost of fertilizer, diesel fuel, and other inputs.

Seed sales and demand for improved seed dropped, placing serious constraints on GSC's ability to purchase any volume of seed.

B. Constraints Experienced Within the Foundation Farm Production Division

- o Lack of a good communication system with the area farm managers and contract growers--only this last year did the Company finally get radio communication with Tamale.
- o Distant location of satellite foundation seed farms without working facilities for farm management and mechanization support teams.
- o Adverse road conditions making transportation difficult for farm inputs, machinery, and produce from foundation farms to processing centers.

- o Lack of diesel fuel during the critical periods of land preparation, harvesting, and evaluation of seed.
- o Lack of a mechanization department within the GSC during the first two years of the project period requiring the production specialist's time to be spent in repair and maintenance of farm equipment.
- o No inventory control system for spare parts and lack of central warehouse storage and workshop.
- o Lack of workshop capability throughout the system.
- o Poor fuel handling facilities causing contamination of fuel systems on tractors and vehicles.
- o No standardization of farm equipment for the project--the myriad assortment of different foreign makes and models in combination with the USAID funded equipment created an impossible situation of stocking the expendable items and spare parts needed. Local supplies of spare parts for the different foreign makes were non-existent at times and prohibitively expensive when they could be found.
- o The political "freeze" on USAID procurement and delayed signings of contracts prevented forwarding PIO/C's on farm machinery and pesticides.
- o Procurement by the AAPC and forwarding of PIO/C's through USAID caused long delays, late delivery dates, and missing items.
- o The inter-row cultivators ordered in 1982 never arrived for weed control on maize production farms.
- o An inherited attitude of "irresponsibility in job performance" of personnel, as a carryover from being government employees in the original Seed Multiplication Unit, MOA.
- o The low liquidity position in the Company limited timely purchase of farm inputs.

C. Constraints Experienced by Contract Seed Growers

- o Sporadic supplies and lack of farm inputs existed in the system.
- o No fertilizer was imported into Ghana in the 1982 planting season.

- o Shortages of diesel fuel existed three out of the four years.
- o There were continuous shortages of spare parts and competent services for farm machinery.
- o Tractor service supplies, by Agric Mechanization, were drastically curtailed and were undependable due to battery, tire, and spare part shortages.
- o Shortages of herbicides and available casual labor for weeding and harvesting existed.
- o Thievery and pilfering of supplies and crops existed.
- o Lack of funding by lending institution as farmer's liquidity dwindled due to drought, monetary devaluations, rapid inflation and increased costs.
- o Delays in processing of seed maize resulted due to electrical power outages and breakdown of the Company's processing centers.
- o Lack of reimbursement for seed delivered to the GSC created financial binds at planting and harvesting seasons.

VI. EXISTING SITUATION

A. Foundation Farms

The current foundation seed levels are more than adequate to supply the foreseeable needs for the contract growers and to maintain a reserve stock to insure ongoing production.

Surplus foundation seed stock will likely be down-graded for general sales if the anticipated increase in seed demand for 1986 planting develops.

B. Contract Growers

Grower interest in seed production remains very high in spite of all the aforementioned problems.

Participation in the 1986 growers program will be dependent upon the company's ability to reimburse the growers for seed delivered the past two years on promise of payment when sold.

There is renewed interest with the recent upsurge in the market prices and the outlook is much improved. The MOA's move to support prices during the harvest time glut and its willingness to look for export markets should restore interest in expanding production.

C. Chemical Supplies - Use and Needs

The present in-country supplies of fertilizer and farm chemicals are satisfactory.

The government handling agencies and dealers face the same position in unsold stocks as does GSC.

The use of fertilizer and pesticide has been greatly reduced over the past two years as cost increased tenfold.

There will be a greater need for the expanded use of fertilizers in order to maintain future productivity. As population pressures build, land becomes increasingly scarce. The fallow resting period is shortened, as the same land must be tilled in shorter intervals with less time for the land to fully rejuvenate.

D. Training and Competence of Farm Managers and Operators

With the redeployment of several farm managers at the beginning of this year, the competence level of farm managers has been greatly improved.

There is a need for training farm managers in doing a more effective job of financial accounting. Cost-volume-profit analysis should be done on each farm and actual unit costs of production should be determined.

This will require an effective farm accounting system initiated through the Company's accounting system. At present no values are placed on stores issued to the farms so values for farm inputs are difficult to determine.

Action should be taken to replace the unresponsive operators with literate and competently trained operators.

E. Equipment Condition and Needs - GSC Farms

With the arrival and able service of David W. Johnson, Agro-Mechanization Specialist (who joined the project in February 1984), together with the employment of a mechanical engineer by the GSC, the USAID supplied equipment was rehabilitated. Most of the machinery is in serviceable condition and should serve the needs for the 1986 cropping season.

The Revised Implementation Plan of 1982 called for replacing and updating production equipment for the foundation farms.

The equipment provided earlier under MIDAS Phase I is generally worn out and outmoded after being in service from seven to nine years.

The newer, larger (90 HP) IH 3288 tractors provided in 1982 are overpowered and have been under-utilized as the older machinery was designed to match the 65 HP IH 674 tractors. This resulted in excessive breakage of tillage equipment when working under the difficult soil conditions of Ghana.

Machinery compatible with larger 90 HP tractors should be ordered. Specifications were prepared under the Revised Implementation Plan. To date no program for orderly replacement of worn out and out-moded farm equipment has been initiated.

The non-AID funded equipment from multiple sources is generally in a poor to non-serviceable condition. Much of it was lacking in quality and good design. Spare parts are in scarce

supply. Great expense would be incurred to rehabilitate this equipment. The dependability of the equipment even then is questionable.

F. Equipment Conditions and Needs of
Contract Seed Growers

Seed growers relying on a mechanized farm operation are facing a serious dilemma.

Because of the rapid cedi devaluation it now takes twenty times the amount of capital outlay to purchase the same machinery package.

The long-term effects of drought and rapidly rising costs have financially drained the farmer so that he cannot replace his worn-out machinery.

Custom rate charges for tractor services increased from a unit cost of 300 cedis in 1981 to the present 2,400 cedis.

In the past Agri Mechanization provided custom operation of farm mechanized services to the farmer within the districts. Problems of obtaining reliable operators, breakdowns of machinery, and lack of spare parts have brought these services to almost a complete standstill.

Agri Mechanization is de-emphasizing custom services and directing their energies towards getting machines back into services and supporting the training of good tractor operators and mechanics.

The end result is that nearly all the larger mechanized farms have had to scale down the size of their operations to fit the serviceable condition of the remaining machinery.

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VII. RECOMMENDATIONS

A. Restructuring of Company Foundation Seed Farms

The GSC Restructuring Committee met in September of this year, inviting constructive comments, considering recommendations, and offering suggestions for operational efficiency, administrative changes, generation of funds up to 1986 sales season, and self-examination of all GSC personnel.

In response, the following constructive comments were offered as suggestions for the restructure of the GSC production division.

- o The foundation seed production farms within GSC are too numerous and dispersed into small inefficient satellite units. This does not lend itself to maximized efficient use of management, administrative, and labor personnel, farm facilities and farm machinery.

By consolidation into fewer and larger units, better supportive facilities can be afforded at lower unit costs of production.

Transportation requirements would be greatly reduced. The productive time of labor and management is now fragmented. By consolidating efforts, they can be more efficiently used in intensifying production and increasing volume.

- o Rice seed is currently produced on three farms--two at Tamale and one in the Bolgatanga area. Each farm has a full complement of machinery and personnel. The immediate production requirements for basic seed could easily be met by the two farm locations in the Tamale area. The Bolgatanga production division can be eliminated and the farm sizes in Tamale can be enlarged in the future if needed. The proximity of the Tamale, Nabago farm, to Bolgatanga is no greater than the Gbedemilisi farm (75 miles) now serving Bolgatanga. The foundation seed requirements, needed to supply Bolgatanga contract farmers, can easily be met from the Nabago farm and taken directly to Bolgatanga for direct processing at harvest time.

The foundation maize seed, presently required for the northern and upper regions, can be transported from the southern sector at less cost than staffing and maintaining the small production farm (50 acres) at Damango, 80 miles distance from Tamale. If the future maize requirements for seed become greater, consideration again could be given for expansion in this area.

- o In the Kumasi area, the five year average of certified seed growers has been 1,026 acres which represents a total foundation seed requirement of only 102 bags of seed. The 40 acre Kwadaso farm, where GSC Kumasi headquarters is located, can easily fulfill this foundation seed requirements. The farm has been left fallow for the past two years for regeneration of soil fertility.

Breeder seed was successfully grown in small acreage using the zero tillage method recommended by IITA Ibadan, Farming System Program. Machinery requirement would be minimized with only a small tractor, slasher, and a field crop sprayer needed.

The Kumasi branch serves the transitional zone of the Brang-Ahafo and Ashanti regions where 80 percent of the country's maize is produced. In the future, foundation seed production may have to be expanded in this area. The present location of the Ejura farm (65 miles) is too distant and the roads are poor. The farm has serious weed infestations of nutsedge (*Cyperus rotundus*) and the soils are light and sandy. Maize suffers a great amount of stress even during short intervals of drought. Based on the past production yields, costs of production on this farm cannot be justified.

If future expansion is required, a new location can be found in the Mampong area within thirty miles. As an alternative, foundation seed production could be negotiated on a contract basis with one or more of the reliable certified seed growers in the area.

- o The immediate requirements for foundation maize seed can be met with production from the Okyerko farm at Winneba and the Ho area farms.

The Okyerko farm has heavy clay soils that sustain the drought periods. It has a definite location advantage in being close to the new processing plant. Seed requirements can be met for the contract growers in that area who support the new processing plant at Winneba. The newly cleared land adjacent to the new site can augment production and be used for isolation requirements and demonstration plots.

The Logba location in the Ho area has poor drainage in wet years; however, it offers insurance against drought years. The farm lacks facilities for handling maize seed production. Presently, it is needed for isolation purposes.

The Asikuma farm has light sandy and erosive soils. However, it has the best handling facilities for production and is useful in isolation of the new 90 day TZESR/W short season variety.

These two farms should be maintained under present production with an eye to the future for consolidation of both farms into a better location, perhaps in the Peki Settlement area. Initial contact has been made with the management of the farm. Sufficient land is available and all the supportive facilities are there including a crop dryer and workshop. Group farmers within the settlement area are also interested in contract maize seed production.

B. Contract Seed Growers

In the beginning, MIDAS Phase I contract farmers were provided farm inputs of seed, fertilizer, and pesticides on credit as incentives to become contract growers with the GSC. These were to be paid in-kind when their seed was delivered to the Company.

This practice was discontinued under MIDAS Phase II as some farmers defaulted on their repayments. Thereafter only seed was furnished to growers on the same basis. No effective measures were taken by the GSC to recover the money from former growers with payments in arrears.

A precedence had been established in company dealings with contract growers. They looked upon the GSC not as a private company, but as a government subvented institution that furnished inputs and cheap seed to help farmers.

Certified seed was being sold at a price slightly above unrealistic controlled government prices. Seed prices of the GSC must meet with the approval of the Ministry of Agriculture. Unfortunately they were considerably below the indiscreetly traded, but more authentic, unofficial prices.

Contract growers did not really understand the actual value of foundation seed. It was given to them at planting time only to be repaid in-kind by unprocessed seed at harvest time. In some cases, growers took enough seed to plant their entire farm acreage. They only returned a token amount of certified seed to replace the seed they had taken. Seed was delivered only when the contract seed price looked favorable at delivery time.

It became impossible to contract for the entire production from the acreage the company had supplied for foundation seed. In the end, GSC had to negotiate the price after the crop had

matured, just prior to harvest. This procedure developed into a collective bargaining session as growers would join together to get the most for their seed.

Neither a formulated price nor volume of seed produced was established and agreed upon between the Company and the growers prior to planting time. In net effect the term "contract production" did not reflect its true or real meaning. In reality the Company was buying on a negotiated price at harvest time hoping to get the needed volume of seed to keep its plant functioning at an economic level. If the Company is expending the cost of producing foundation seed of high production potential and maintaining the facilities for processing, quality control, sale and distribution of improved seed, it must also have control over the contract cost and total volume of certified seed produced.

In developing nations the "multiple contract grower concept" is questionable. It is extremely difficult to implement because of the fast developing and unpredictable economic and political changes that take place. The infrastructure is generally not there to support a widespread, complex, vertically-integrated structured organization.

An alternative to consider is to contract specified production with large, well-established commercial operations strategically located in maize producing areas. The SCOA farm located in Kesewa is ideally located for serving the Winneba plant needs. The large (6,000 acre) commercial maize production farm could be another source for the major maize growing area in the transitional zone of the Ashanti Brang-Ahafo region. This would eliminate dealing with a large number of uncertainties, assure adequate supplies, and greatly reduce the multiple logistical problems in the area of quality control, transportation, and coordination of harvest with the processing centers.

The target or volume of seed production must be compatible with the processing plant size and storage capacity to accommodate the production within the relatively short time of the harvest period.

In view of parameters that involve the entire success or failure of a private seed company, the overall national production must be considered. Successive sales are dependent on related and supportive programs and activities. Limited acceptance of improved seed by farmers is not due to any fundamental resistance to use of improved seed but rather, to high prices of seed, lack of timely delivery of seed, and low official production prices for crop sold. The demand for certified seed depends on the participation of farmers with market orientation. The small farmers tend to produce only for small home consumption and are reluctant to buy improved seed at higher than mar-

ket prices because of adverse reaction to risks involved. Therefore, one must analyze the composition of the market and plan the size of production units within Ghana accordingly.

Table VII-1 shows the relative size of maize farms in Ghana (Small Scale - 0 to 5 acres, Intermediate Scale - 5 to 10 acres, and Large Scale - 20 acres or larger).

TABLE VII-1. SIZE OF MAIZE FARMS IN GHANA

| Percent- age | Scale | Acreage | Total Seed Requirement <u>a/</u> | Certified Seed Requirement 25 Percent <u>b/</u> |
|-----------------|--------------|----------------|--|--|
| 60 | Small | 750,000 | 75,000 | 18,750 |
| 30 | Intermediate | 375,000 | 37,500 | 9,375 |
| 10 | Large | <u>125,000</u> | <u>12,500</u> | <u>3,125</u> |
| | TOTAL | 1,250,000 | 125,000 | 31,250 |

a/ Expressed in 200 pound bags based on 1 bag to 10 acres.

b/ Needed to maintain genetic purity of composite maize seed.
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As presented in the above table, the most likely potential of seed sales would be for the small requirements of the intermediate and large scale farmers which totaled 12,500 bags of certified seed (25 percent requirement) needed to maintain the composite varieties. However, the larger seed sales, and perhaps least potential, lie in the small scale farmer (0 to 5 acres) category. Their requirement would be 18,750 bags yearly in order to replace their total seed requirement every four years.

A problem emerges in serving the needs of numerous small scale farmers scattered throughout the country with small amounts of seed. Distribution costs, promotional and educational activities to increase sales, are cost prohibitive in relation to the volume sold. In view of the national interest, it may be necessary for the government to partially subsidize sales and distribution costs to the large number of small scale farm units.

In the present precarious liquidity position of the GSC the credit repayment ability and continued operational capability is severely threatened. There is no certainty that it will be able to achieve the fiscal goals needed to exist and operate as a private seed company.

In order to cover the ever-increasing recurrent costs from its own earnings, a large seed volume must be handled. Only volume can keep the per unit cost of processing and handling at a level where its seed prices can remain competitive. The large market potential of the small scale farm must be tapped if needed sales volumes are to be obtained.

If the GSC is to serve as a national institution and service national seed needs in accordance with demand and agricultural sector priorities, a large government support program may be required.

Historically, the MOA extension services are involved in country-wide seed promotion, sales and distribution. The 465 sub-district extension officers could effectively be used in developing a comprehensive promotional marketing and distribution network. This important supportive role for national interest would be a means of getting improved seed to the small scale farmer.

VIII. ACKNOWLEDGEMENTS

The assistance and cooperation received from the members of the senior staff of GSC was greatly appreciated. The officers were:

| | |
|-----------------------|----------------------------------|
| Mr. J. Wobil | Managing Director |
| Mr. E. Blay | General Manager |
| Mr. P.M.T. Kitcher | Administrative Manager |
| Mr. P.K. Poku | Production Manager |
| Mr. F. Hammond | Processing Manager |
| Dr. V.K. Ocran | Research Manager |
| Mr. A. Amihere | Quality Control Manager |
| Mr. O. Gyamera-Amoako | Sales and Distribution Manager |
| Mr. J. Erzuah-Nyenzah | Chief Accountant |
| Mr. E. Odei-Addo | Mechanization Department Manager |

The junior staff members and the support staff (technical officers, drivers and other workers) were most helpful. Mr. Ben K. Afful, Assistant Mechanization Officer, deserves special recognition for providing his services for maintenance and repair of the project vehicle; and his able assistance in driving on long extended treks to the outer regions.

The cooperation of the area managers and their support staff was most appreciated. The foundation seed farm managers, divisional assistants, mechanics, machine operators and farm workers are to be commended for their understanding and hard work in the field despite the numerous problems encountered.

Appreciation should be extended to the former American Ambassador, Mr. Thomas W.M. Smith, and Ambassador Robert Fritz, now serving Ghana, for insuring the welfare of the team and giving support to the project.

The USAID Mission Directors and their staff have been understanding and supportive in their roles with the project. Four mission directors served during the period: Mr. Gerald Zarr, Mr. Larry Saiers, Mr. Roy Wagner and the present Director, Mr. William Lefes. Program officers overseeing the project have included: Mr. Frank Mertins, Mr. Steve Szadek, Mr. William B. Flynn Jr., Mr. John Thomas, and Mr. Tom Luche. Executive officers, Mr. Gilbert Dietz and Mr. Jeremiah Parson, provided the facilities of a good home which were much enjoyed.

The management and staff of the American Club and Commissary are to be thanked for sustaining morale and helped in providing the social and physical amenities of life.

The enthusiasm and determined efforts exhibited by the colleagues of the Experience, Incorporated team were a reflection of the team leader, Mr. Orris Shulstad and his energetic and incessant drive to accomplish the project goals. Greatly appreciated was the cooperation and encouragement given by the associate specialists: Seed Quality Control, Mr. William Hall; Agro-Mechanic, Mr. David Johnson; Business Analyst, Mr. Guy Hill; and Processing Plant Training TDY Specialist, Dr. Paul Mezynski.

Last, but not least, the administrative support received, and visits made, by Mr. Duane Eriksmoen and Mr. Kenneth Holt provided morale boosts and benefits to the whole team. Also to be recognized is the sustained backup of the Experience, Incorporated headquarters staff and the support in emergency procurement by Mr. Robert Locke in the Washington D.C. office.

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GHANA MIDAS II SEED MULTIPLICATION PROJECT
PROJECT NO. AFR-0102-C-00-2003-00

END-OF-TOUR REPORT

David W. Johnson
Agro-Mechanization Specialist
February 5, 1984 to March 31, 1986

I. INTRODUCTION

The Agro-Mechanization position was created in 1983 under Amendment No. 2 to the MIDAS II project. This was six years after the first agricultural equipment and vehicles had been delivered to Ghana Seed Company (GSC) under USAID assistance. Mr. Sandager, the Production Management Specialist, was spending a great deal of his time performing mechanical work to keep the Company's equipment in operating condition. Due to the freeze in USAID funded support, the position could not be filled until early 1984. The Agro-Mechanization Specialist arrived on February 5, 1984 and departed March 31, 1986.

No mechanization section existed within the GSC prior to the the Specialist's arrival. An assistant engineer, to serve as a counterpart to the Specialist, joined the Company in June of 1984. With his arrival an effort was made to create a mechanization section in 1984 but this did not materialize. The mechanization section was given a level of recognition at the head office in 1985 when the assistant engineer was asked to join the weekly Company staff meetings. The section has little or no control over equipment and mechanics at the different area offices of the Company. These are under the control of the Area Managers.

The technical stores (parts stores) and purchases of local supplies, including parts and outside repairs, are controlled by the financial section. The current transport officer is also the cashier and answers to the chief accountant, not the assistant engineer. Efforts to hire a full-time competent transport officer failed.

Personnel in the section besides the Specialist are the assistant engineer, Mr. Ebenezer Odel Addo, head of the Mechanization-Transport Section and Mr. Benjamin Afful, the workshop supervisor. Mr. Afful, having been with the GSC for over five years, is the section's institutional memory. The head office has two mechanics and one electrician who report to the workshop supervisor. Each area has between one and four mechanics who report to the area production managers.

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II. ASSIGNMENT

The objectives of the Agro-Mechanization position were to improve the GSC's equipment performance and extend its life. This was to be done by training the Company's mechanics and operators in the proper care and operation of the equipment, and establishing a parts storage and inventory control system.

All of the Company's production equipment and transportation vehicles at the head office, area offices and farms were within the scope of the Agro-Mechanization section responsibility.

The duties of the Specialist as detailed in the amendment creating the position were:

- o Assist the GSC to organize and operate central, regional, and on-farm agricultural equipment workshops to enable timely and effective repair of farm machinery, trucks, and other vehicles utilized in the Company's seed production activities.
- o Establish and implement a maintenance schedule for all GSC equipment, including agricultural machinery and vehicles.
- o Establish repair facilities and operational procedures to assure that all equipment is repaired in a timely fashion.
- o Establish a logistics system for the procurement, storage and distribution of spare parts.
- o Train Ghanaian staff to carry on the above functions.

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III. WORK PLAN

When the Specialist arrived, the GSC had no workshop facilities at the head office. There were very limited facilities at the Tamale and Kumasi area offices. Basic hand tools and other equipment were in short supply at all locations.

Some very expensive and useful equipment was in storage in Winneba, where it had been for five years, due to the lack of a place to put it to use and no one to train the Ghanians how to use it.

Plans were developed to establish a good central workshop in Accra with regional workshops to be set up at Winneba, Kumasi and Tamale. Other areas and each farm were to be provided with tools and equipment to enable them to do servicing, preventive maintenance and routine repairs.

Each area office had operator and repair manuals for most of its equipment. The recommended service intervals and procedures were to be developed and emphasized. In addition a maintenance guide was to be developed to assist the mechanics in their work and allow for checking their performance.

Pre-season servicing and repair of equipment was to be implemented with the Agro-Mechanization Specialist and his counterpart to assist the local mechanics as much as possible. The Agro-Mechanization team would also plan to be in areas during peak use seasons, i.e., planting and harvesting, to help with breakdowns.

Parts storage and a retrieval system were identified as a serious need for the GSC. The new office building would provide a storage area and a simple card inventory system was to be set up to locate parts by their part number.

On-the-job training for most mechanics was the preferred method so they would be working with their own equipment under their normal conditions. A training session was planned for the workshop equipment when it arrived and was set up in a workshop. It was hoped some of the top mechanics could be sent for specialized training in the U.S. on some of the Company's sophisticated American made equipment.

Orders were to be written for spare parts, hand tools, shop equipment, farm equipment and vehicles. These were to include specifications to meet the GSC's needs and withstand the tough operating conditions found in Ghana.

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IV. IMPLEMENTATION

A. Workshops and Tools

No workshop facilities had been completed at the time of the Specialist's departure. Two workshop buildings were under construction at Accra and Winneba with no expectations they will be completed in the near future. The orders and specifications for hand and shop tools had been prepared but not forwarded by USAID for procurement and delivery to the GSC.

The move to the new office building in June of 1985 did improved the Agro-Mechanization's facilities somewhat. There was a larger tool storage room, an office for the assistant engineer and workshop supervisor, and a good parts store in which specialized tools and equipment could be stored. There were also work tables for the mechanics in the parts store and outside in the shade of the building.

With the assistance of Mr. Sandager and Dr. Paul Mezynski, the short-term seed processing consultant, some of the larger shop equipment that had been in storage at Winneba was set up in the newly completed seed processing building. This equipment included the electric welder, oxy-acetylene torch, drill press, hydraulic press, electric grinders, air compressor and various power hand tools. Also, with their assistance, members of the Ghanaian staff were taught the proper use of this equipment.

Other tools that had been in storage at Winneba were brought to Accra and put to use. The existence of a storeroom where they could be safely kept made this possible. Again the Ghanaian staff was taught how to properly use these tools.

A limited amount of tools and other equipment either from storage, old orders that finally arrived, or from the Experience Incorporated limited procurement fund were supplied to the area and farm mechanics. While this was not enough to satisfy their needs it did improve their capabilities.

B. Farm Equipment Repair

Several pieces of farm equipment and vehicles that were out of service on the Specialist's arrival were put back in service. All of the USAID supplied farm equipment that was operational on the Specialist's arrival was kept in service and in some cases its reliability improved.

Two tractors damaged in accidents were repaired and put back in service. The Experience, Incorporated limited procurement fund was instrumental in this effort.

The limiting factors in equipment rehabilitation at the GSC were spare parts, workshop facilities, and skilled people. The agricultural equipment fared better because there was a larger supply of spare parts. Most of the problems were relatively simple so the tools and skills of the people in the Company were sufficient to solve them. Also the need to keep the agricultural equipment going was greater. Each farm needed its equipment to produce seed so more time and effort was spent by both the Agro-Mechanization team and the Production Management Specialist to keep it going.

C. Vehicle Repair

The Specialist vehicles were all kept in good running order. Again the EI limited procurement fund made this possible by providing necessary parts. Tune-ups, replacement of brakes, exhaust systems and tires as well as adjustment and replacement of front suspension and steering parts were the most common jobs. The more complex jobs, such as a cracked frame, are difficult and time consuming without a workshop.

Unfortunately the rest of the Company's vehicles did not get the same level of attention. While the routine maintenance was, for the most part, adequate, the lack of spare parts (especially for non-U.S. made vehicles), workshop facilities and enough skilled mechanics precluded much of the preventive maintenance that should have been done. They also prevented some of the Chevrolet vehicles from being rehabilitated.

No major spare parts for the heavy Chevrolet trucks were received during the Specialist's tour. Orders for these 7 and 10-ton trucks were made up early in the tour but were not forwarded for procurement by USAID as the procurement contract with AAPC had expired.

A parts order for the Chevrolet crew-cab pickups did arrive. Work was started on two of the pick-ups but not completed due to a lack of time. The assistant engineer and workshop supervisor will complete these repairs.

Parts for the Leyland heavy trucks and Datsun pickups proved to be very hard to find in the local market. In the last few months this situation improved; but, the cost of these parts were beyond the financial means of the GSC.

There is no place at the Accra office to work on a vehicle where there was protection from the weather, sun or rain, and no solid floor on which to set jacks and other equipment. Work in progress cannot be protected from the elements. When it rains the mechanics work in water or mud the next day. Also all tools and loose parts must be moved into the office building each night as protection from thieves.

D. Mechanics

Besides the Specialist only four people in the Agro-Mechanization section were able to read and follow the instructions in the equipment service manuals. The only ones to do this routinely were the assistant engineer and the workshop supervisor in Accra. Complicated repair jobs, that they or the Specialist did not get to, either did not get done or were not done properly.

A maintenance guide was developed to assist the others in doing routine and preventive maintenance. Its use was explained to the mechanics and questions answered. A follow-up indicated only the mechanics in Tamale and Bolgatanga were using the guide. The others may not be able to read well enough to fill out the form.

The pre-season maintenance and repair program and the effort to be at the farms during peak use of equipment were both very successful. These were good times to work with both the mechanics and operators on the adjustment, lubrication, the need to keep nuts and bolts tight and the proper operation of equipment. The assistance of Mr. Sandager in this program must be acknowledged.

Overall servicing and maintenance of the Company's vehicles and equipment did improve during the Specialist's tour. Perhaps much of this improvement can be attributed to the efforts of the two specialists who worked with the equipment. The counterpart knows what needs to be done and can do it if the GSC will provide the transport and support he needs. The operators and mechanics in the field, for the most part, know what they should be doing but for some reason do not always do it.

E. Mechanic Training

On-the-job training was the rule for mechanics and operators. During pre-season servicing and other visits to the farms and area offices, the Specialist worked with the mechanics and operators to show them improved ways to operate and service their equipment. Items covered included changing oil and filters, the proper time and way to change fuel filters, repacking wheel bearings and other greasing, adjustments and the need to keep all fasteners tight.

Due to the distance from farms to area offices and the lack of a communication system, mechanics were not always at the farms or offices when the Agro-Mechanization team visited and valuable training opportunities were lost. The lack of a shop facility and the GSC's financial constraints made it impossible to assemble the mechanics in one place for a hands-on training session.

Time was spent with the Accra electrician teaching him how to diagnose electrical problems; also the proper methods of rebuilding alternators and starters were demonstrated.

F. Parts Storage and Inventory

Probably the greatest improvement at the GSC was the parts store. It went from having parts in five different locations with little or no inventory or protection, to one good, though crowded, parts storage room with a numerically sorted, by part number, card index on the parts. Even the older parts that were missing their numbers were, for the most part, identified and properly stored. The storeman was trained in maintaining a current index and checking it when doing yearly inventory. This activity took up a good share of the Specialist's time for almost a year.

G. Preparation of Specifications

Specifications were written for tools to equip all the planned workshops. Lists were made up for hand tools to supply the needs of all the mechanics and farms. Vehicle specifications were developed for a set of replacement parts for the light and heavy trucks to meet the Company's transportation needs. Spare parts lists were compiled to cover all the Company's USAID-supplied equipment and vehicles to meet the Company's needs for the next two or three years. None of these were forwarded by USAID for procurement.

Numerous orders were placed through the Experience, Incorporated limited procurement fund with good results. The parts and supplies obtained through this procedure helped keep the GSC operating. Keeping the trucks and equipment operating without these parts would have been very difficult.

H. Constraints

Several constraints exist within the GSC that prevent the Agro-Mechanization section from doing the job that will meet the Company's needs.

- o The lack of workshop facilities and tools are among the most recognizable; these could have been easily solved if they had been addressed early in USAID's support to the GSC.

- o Tools and facilities are only useful and productive if there are qualified people to use them. As stated earlier the Company has only four mechanics in the Agro-Mechanization section who are qualified and could be more productive with improved tools and equipment.
- o Reasons for this lack of personnel are many. Low pay makes it hard to attract good people as does the lack of facilities and equipment. The remoteness of many of the Company's work areas make them unattractive to educated people. Management in Ghana and the GSC do not readily accept the idea that well educated, literate people are needed to operate and maintain equipment.
- o The lack of additional training opportunities either funded by the GSC or USAID are a deterrent to keeping current employees or hiring new ones.
- o The section's undefined position within the GSC's management structure has not helped. While the assistant engineer has been accepted in management meetings, he has not been given control of the vehicle fleet, drivers, tractor operators or area mechanics. He also doesn't have the staff to handle these if he was given the authority. On the other hand he is being held responsible for the maintenance and repair of the equipment these areas cover. Not an easy task.

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V. EXISTING SITUATIONS

A. Farm Equipment

The majority of the agricultural equipment in use at the GSC is seven years old; the newest is four years old. As shown in Table V-1 most equipment is in serviceable condition; but, this situation will not last very long without a source of spare parts. The purchase of the parts on the list developed by the Specialist before his departure would help a great deal. For the Company to be able to continue to produce seed, the new equipment on the list developed by the Production Management Specialist is urgently needed.

B. Transport Vehicles

Company management claims the Company has a transport and haulage vehicle shortage. Transferring the Specialist vehicles to the GSC by USAID will help alleviate the transport shortage. Table V-2, listing vehicle condition, shows that vehicles over four years of age are not very reliable. The improvements in the Agro-Mechanization section may improve this situation. Under current Company conditions a better way to extend vehicle life would be better control to decrease both their use and abuse.

A large supply of spare parts will be needed to rehabilitate the Chevrolet vehicles. The lists of parts to do this are held by the GSC. It might be more economical in the long run to replace these vehicles rather than repair them.

The Datsun pickups and Leyland 10-ton trucks are still operating fairly well. The Company will have to begin spending much more money on maintaining these pickups to keep them operational.

C. Workshops

The workshop in Accra has only the foundation, floor, and some of the walls completed. The one at Winneba has the foundation started. No expected completion date has been set on either workshop. The Company is not in a position to spend money to improve the facilities at Kumasi or Tamale. There is no urgency to improve these workshops as there are no tools or equipment to put in them. The tools and shop equipment lists with specifications have been supplied to USAID and the GSC.

TABLE V-1. FARM EQUIPMENT SUPPLIED BY USAID

| Quantity | Item | Make and Model | Year Supplied | Condition and Remarks |
|----------|----------------------|----------------|---------------|---|
| 5 | Tractors 60 hp | IH 674 | 1978 | One being repaired. Other four in service. Some in need of minor repairs and adjustment. A good supply of parts on hand but some essential items depleted or in short supply. |
| 5 | Tractors 90 hp | IH 3288 | 1982 | One in need of parts to repair front axle. Others in service. A good supply of parts on hand but some essential items needed. |
| 1 | Tractor 35 hp | Ford 3610 | 1982 | Out of service. Fuel injector pump being repaired. Fair supply of parts on hand. |
| 5 | Disc Plows | Athens 300 | 1978 | In fair shape. A lot of repairs made in past year. Part supply getting low. |
| 2 | Disc Plows | Davis | 1983 | The one at Winneba rebuilt and in good shape. The one at Tamale needs to be rebuilt. |
| 5 | Disc Harrows | PM Company 505 | 1978 | All in usable condition. All of certain parts have been used so will not be able to repair them without more parts. |
| 5 | Packer Mulcher | PM Company | 1978 | All in usable condition. Some parts needed to make future repairs. |
| 3 | Field Sprayers | Centery | 1979 | Serviceable. |
| 2 | Fertilizer Spreaders | Wikom | 1979 | Serviceable. |
| 3 | Corn Pickers | New Idea | 1979 | Two in serviceable condition. Some parts needed. |
| 1 | Slasher | Side Winder | | |
| | | GB-722 FMC | 1979 | Serviceable. |
| 3 | Wagons | Kasten | 1979 | Serviceable. |
| 1 | Combine | IH 715 Rice | 1979 | In fairly good shape. Need some parts to keep it there. |
| 1 | Corn Planter | IH Cyclo 400 | 1979 | Serviceable. Having trouble with fertilizer drive. |
| 2 | Corn Planters | IH 800 | 1982 | Serviceable. |
| 1 | Lowboy Machinery | Beck Tandem | | |
| | Trailer | Wheel | 1982 | Good condition. |

The following equipment supplied in 1982 for the Mile 38 research farm is all in serviceable condition:

1 Plow Pittsburg 2 bottom, 1 Disc Harrow Pittsburg 303, 1 Field Cultivator Pittsburg 9 shank, 1 Corn Planter Cole 12 MX 2 row, 1 Fertilizer Spreader Herd, 1 Rotary Slasher Rino No. 5, 1 Hudson Portable Sprayer.

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TABLE V-2. CONDITION OF VEHICLES SUPPLIED BY USAID

| Quantity | Make and Model | Year Supplied | Condition and Remarks |
|----------|--|---------------|--|
| 1 | Chevrolet 10-ton Truck single axle | 1977 | Out of service. Needs complete suspension rebuilding. Engine removed to put tanker truck back in service after its engine was damaged. No parts on hand or order to complete repairs. |
| 1 | Chevrolet 10-ton Truck twin axle | 1978 | In service. Converted to 3,000 gallon fuel tanker. In fairly good shape after cannibalizing above truck. |
| 3 | Chevrolet 7-ton Trucks with 4-53 Detroit Engine | 1979 | One that is serviceable has bent frame and truck bed rusted beyond use. Between it and unserviceable one in Accra one usable truck can be made. Transmissions and rear axle were repaired on Bolgatanga truck. Still seems to have engine and cooling system troubles. Not in service. |
| 1 | Chevrolet 7-ton Truck with GMC V-8 Diesel Engine | 1980 | In service. |
| 6 | Leyland 10-ton Clydesdale | 1983 | All in service. Maintenance and repair requirements have risen drastically in the last year. |
| 1 | Ford Custom Pickup | 1977 | Sold. |
| 1 | Chevrolet Crew Cab | 1979 | Out of service. Partly repaired, should be operable. |
| 3 | Chevrolet Crew Cabs | 1980 | All out of service. Parts on hand to repair two of the three. |
| 6 | Chevrolet Suburbans | 1977 | Three in service, one being repaired, one wrecked and being cannibalized, one to be sold. |
| 2 | Datsun 1600 Crew Cab Pickups | 1982 | Both in service but losing reliability. |
| 12 | Datsun 720 Diesel Pickups | 1983 | 10 in service. Two out of service with engine and transmission trouble. Being cannibalized to keep others running. |

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D. Maintenance and Service

Routine maintenance and servicing of GSC vehicles and equipment has improved. A maintenance guide is available for the mechanics to use. Operator and service manuals are available either from area offices, farm managers, or the head office in Accra. Mechanics and operators know what they must do to maintain their equipment but for some reason do not appreciate its importance and fail to perform.

E. Spare Parts

Almost all of the GSC's spare parts are safely stored in Accra. The stores man maintains a card index by part number that helps him find the needed parts. A few large parts are still stored at Winneba. Parts at area offices are not completely inventoried; but, are controlled by the local stores man.

F. Training

On-the-job training has improved the GSC mechanics' performance and may have taken most of them as far as their abilities permit. Modern trucks and agricultural equipment cannot be cared for by uneducated, illiterate people; therefore, better people must be employed.

The assistant engineer and workshop supervisor are both qualified and competent. Both need better staff to help them do the job. Also both would benefit from additional training.

E. Specifications

Specifications and lists for new equipment, vehicles, tools and spare parts have been prepared and submitted to the GSC and USAID and are awaiting action.

VI. RECOMMENDATIONS

Most of these recommendations have already been mentioned in the body of this report. These and the others are predicated on an improvement in the GSC's overall financial condition.

1. Recognize the Agro-Mechanization section's responsibilities within the GSC by giving it control over all vehicle, equipment, drivers, operators, and mechanics. At the same time provide the Company with the staff required to perform this function.
2. Staff the Company workshops with educated, literate mechanics.
3. Complete workshop facilities and supply them with the equipment and tools that are on the list submitted to the GSC and USAID.
4. Order needed spare parts for equipment and vehicles.
5. Send some of the mechanics and supervisors for additional training on the Company's equipment.
6. Finish inventorying all spare parts the GSC has at all locations in a central inventory card index.
7. Reduce the number of Company farm locations.
8. Order new agricultural equipment and vehicles when the Company has developed a plan for proper use, care, and maintenance.

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VII. ACKNOWLEDGMENTS

The cooperation and support of many people made this tour pleasant and productive. The officers at the head office, area managers, and other members of the Ghana Seed Company staff were very supportive. Special thanks go to the assistant engineer, the workshop supervisor, the mechanics, the electricians, and all other members of the Agro-Mechanization section.

The Experience, Incorporated team in Ghana, USAID staff members and consultants and the Experience, Incorporated home office staff, as well as the procurement officer, were all supportive and helpful. Their efforts are gratefully acknowledged.

And finally a thank you to Ghana and all the Ghanaian people for providing a nice place and background in which to work.

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GHANA MIDAS II SEED MULTIPLICATION PROJECT
PROJECT NO. AFR-0102-C-00-2003-00

END-OF-TOUR REPORT

Guy C. Hill
Consulting Management Accountant
March 25, 1985 - March 25, 1986

High resolves don't put bread on the table
or pay for tuition in school.
They don't pay for a doctor or dentist,
without money, life can be cruel;

So we have to get up on our hind legs,
and shout to our neighbors and friends,
Let's get off our duffs and do something
High resolves must have means that bring ends.

(Susan Kling, 'High Resolves')

I. INTRODUCTION

In every organization what is usually stated as the cause of organizational ills in reality seldom is. For the most part, the deficiencies cited are a manifestation of a far greater problem of which they are but a part.

The Ghana Seed Company (GSC) proved no exception. Deficiencies in accounting and the total absence of cost accounting and cost control were found to be well-diagnosed. The deficiencies in the accounting system was the result of management's downgrading the accounting function. The function of accounting by staff was not understood by all levels of management. At the same time, the accounting staff were unaware of management's role and their obligations to the organization.

Selection of senior accounting staff was made without consideration to the advice of professionals in the field. Thus, staff were assigned to duties in the accounting department without any experience in their duties and obligations. The situation in this regard called to mind the words of the poet:

"Oh what a tangled web we weave
when first we practice to deceive"

Because of the selection of inexperienced, unqualified senior staff, there exists a total lack of strong leadership and training within the department.

The role of the accountant within the organization was ignored and the staff had degenerated into mere recorders of information without any regard to the necessities of information for decision-making. Accounting records were in arrears and little effort was made to produce year-end figures other than for the external auditors. At what is the busiest time of the accountant's year--year-end closing--the majority of the accounting staff, and those responsible for providing accounting information, were on vacation. Inventories could not be completed expeditiously because the staff had taken the keys with them. Management style, a lack of expertise, and a total lack of strong leadership is the root cause of the situation encountered. Accounting knowledge was weak. There was an absence of will to resolve problems.

It was within this atmosphere of lack of trained staff, lack of direction, and lack of strong leadership, that the terms of reference were approached. The design, recommendations, and implementation of a cost accounting system must follow a logical course from expense through to cost centers and to final inventory accounts. An Accounting Manual must, in these circumstances, be comprehensive as it serves as a reference book in times of doubt, as well as a method of induction into accounting and cost accounting methods and procedures. The ultimate purpose is standardization.

A. Assignment

The assignment involved devising, recommending, and implementing a cost and financial system within the Ghana Seed Company. This involved a complete study of the organization.

A report "A Study of the Problems of the Ghana Seed Company and Recommendations on Cost Ascertainment and Cost Control" was issued in September 1985, and was followed up by an Accounting Manual in February 1986.

At the very outset, it was apparent that a fully committed counterpart would not be available and repeated efforts to remedy this shortcoming were not fruitful. There were months in which a counterpart effort was totally absent due to day-to-day work pressures.

Requests for current financial data were frustrated due to ledger write-ups being months in arrears. Thus, an important aspect of a consulting assignment--guidance--was absent for some months but was never available on a current basis. In every facet of financial management, glaring defects were obvious.

The audit arm, an essential aspect of management control, was inexperienced and ineffective. Thus, far from being able to seek out organizational weaknesses and defects from audit reports, it was necessary to conduct a total review.

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II. AN INTEGRATED CONSULTING APPROACH TO THE PROBLEMS OF THE GHANA SEED COMPANY LIMITED, ACCRA, GHANA

The work plan for the approach to the terms of reference involved the division of the allotted time span into four phases of work.

The first phase required an indepth study of the whole organization and involved policies, systems, procedures, and internal controls, all with a view to determining weaknesses and correcting them.

The second phase--feedback from Phase I--involved: devising systems, drafting a manual, testing drafts against actual operating circumstances and revising them where necessary. This phase also required perusal of accounting files for past instructions to the accounting group. There was no relevant data on file and thus the assignment involved setting up a system which would meet normal operating circumstances. Phase II was carried over into Phase III at which time final recommendations on systems and manual were completed.

It was in the second and third phases that a total lack of administrative support for the task was apparent. Efforts to obtain the services of a typist did not succeed until the end of July. The 'experienced' typist made available for full time work was a beginner who received on-the-job training at the expense of efficiency and speed. Thus, what was originally planned as a second phase operation stretched into the complete period allotted to the third phase and the beginning of the fourth phase, drastically curtailing availability of time for the final phase. At the same time, typing paper and stencils as well as duplicating paper were not made available as required, resulting in loss of effective time. The Accounting Manual was finally completed through the Experience, Incorporated consultant purchasing paper. By this means, the Accounting Manual was finally produced and issued the first week of February 1986. This left little time to explain, introduce and provide basic initial training to the Area Accounting Staff.

In order to overcome some of the problems which could occur at a later date, area staff were issued worked-through, monthly accounts complete with notations.

Phase I and II were the most important periods in the consulting assignment. The initial survey was expanded to meet the request of the USAID Director for a report on the Company which was issued in September 1985. The report, "A Study of the Problems of the Ghana Seed Company and Recommendations on Cost Ascertainment and Cost Control" should be considered an integral part of assignment reporting.

The Company survey revealed serious management flaws as well as flaws in the organizational structure. These were contributory factors to the serious fiscal problems of the Ghana Seed Company. Managers do not possess a grasp of what management is nor do they possess adequate training for the task. A contributory factor to the managers' attitudes was a lack of responsibility for accounting, lack of realistic sales forecasting, and a lack of proper understanding of the true role of the accounting function. Remedying this is by far the most serious immediate problem facing the Company. Failure to correct this deficiency bodes ill for the future health of the Company. Management inexperience was compounded by a failure to secure the financial and administrative base at the outset of operations. If properly done, this would have provided the essential information and controls to monitor the organization's health. Centralization of the accounting function, without an infrastructure to deal with it, deprived the organization of the essentials of good financial controls namely, checks and counter-checks upon each level of cost incurrence. Centralization proved no panacea for the ills of the organization but rather a contributory factor as it removed effective responsibility for costs from operational management. It also failed to provide the necessary danger signals needed to alert management to loss situations.

The survey further revealed serious flaws in inventory controls. The stores system does not form part of the financial accounting system. No values are attached to the individual items in stores and as a result issues and receipts are not recorded with monetary values. The mechanism for effective incorporation of stores accounting into the Financial Accounting System has been laid down but at the date of this report has not been implemented due to a total absence of strong, experienced, qualified, financial leadership.

Seed inventory controls in the southern sector were found nonexistent and, to some degree, were due to the lack of appreciation of the need for proper accounting of assets. No attempt was made to minimize seed losses due to spillage, bad handling, and inadequate storage. These are areas which require urgent management attention. Repeated checks had to be carried out on year-end reporting of inventories because of omissions. This lack of management control can best be illustrated by an extract from an area's 1985 seed inventory report:

| | |
|---------------------------------------|--------------------|
| Cool Room Stocks | 3,951 minibags |
| Low germ not weeviled | 722 minibags |
| Heavily weeviled - partially caked | 108 minibags |
| Losses due to mice | 63 minibags |
| Total Inventory | 4,850 minibags |

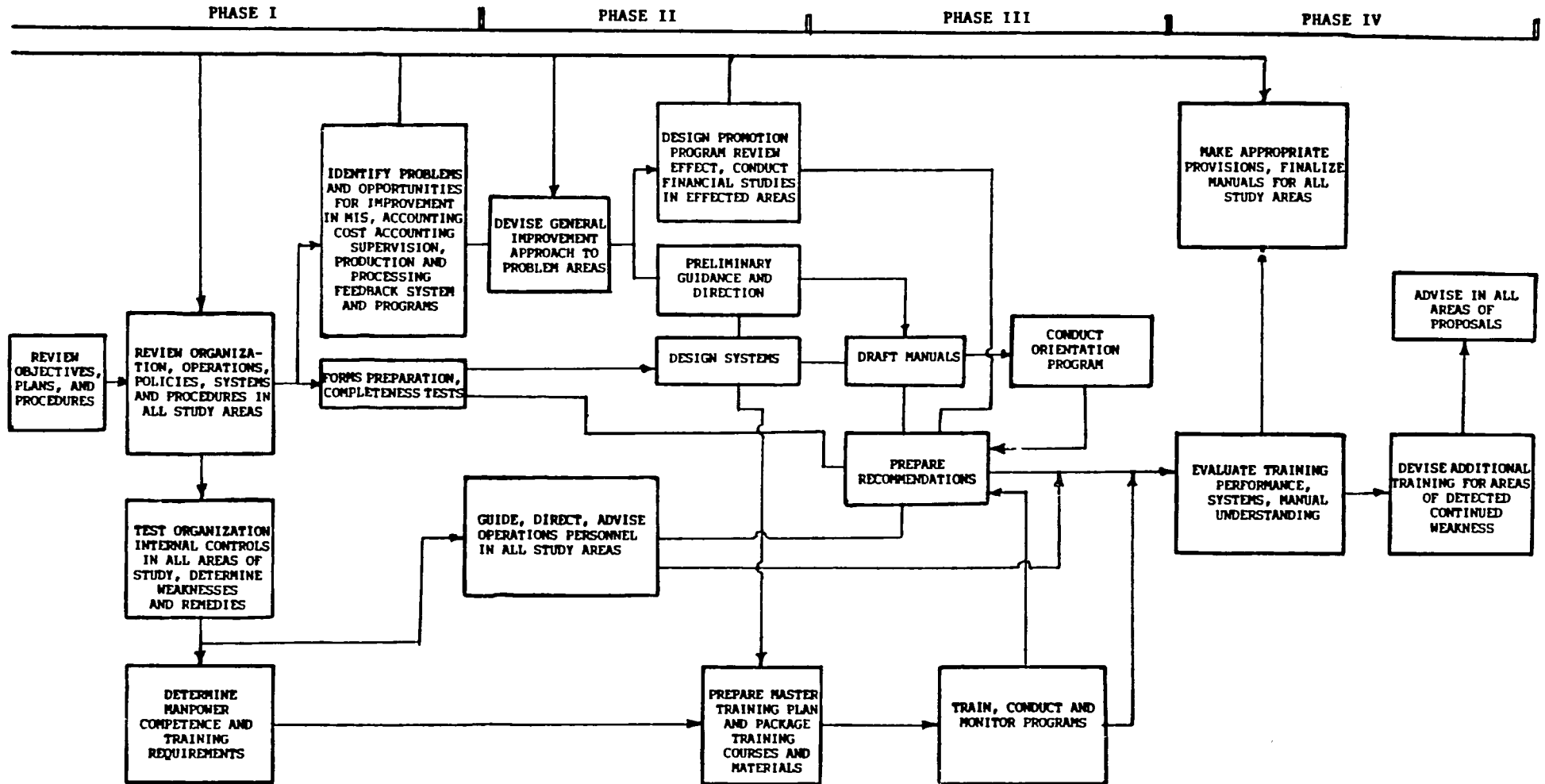
These problems were addressed in the Accounting Manual.

Figure II-1, is an illustration of the integrated consulting approach to systems improvement within the Ghana Seed Company.

Devising, recommending, and installing a Cost Accounting System, and producing an Accounting Manual must be considered the end of the initial work plan of laying the foundation for a system. Normally, the end of this work plan marks the beginning of a second work plan which often requires the most concentrated effort by the consultant.

This second phase requires an extensive training plan, which cannot be accomplished within the term of a year, given the state of the Company and its personnel. It should, therefore, be considered that in the time span allowed, we have merely complied with the terms of the assignment. Full, smooth working implementation of the system requires follow-up as well as a basic change in management attitudes and a major reorganization of the accounting department. This was recommended in the report, "A Study of the Problems of the Ghana Seed Company and Recommendations on Cost Ascertainment and Cost Control."

FIGURE II-1. GHANA SEED COMPANY - DIAGRAM OF THE INTEGRATED CONSULTING APPROACH TO SYSTEMS IMPROVEMENT



III. PREREQUISITES TO AN ONGOING SYSTEM OF INTEGRATED FINANCIAL AND COST ACCOUNTING WITHIN THE GHANA SEED COMPANY

At the outset, stipulations were laid down as to the basic requirements for an ongoing system of Integrated Financial and Cost Accounting within the Ghana Seed Company. These stipulations were:

- o Decentralization of accounting operations to area levels;
- o Fixed asset inventories taken with valuation;
- o Physical inventories of general and spare parts stores with valuation;
- o Physical inventories of all seed with valuation at cost;
- o Verification of all Accounts Receivable;
- o Verification of all Accounts Payable;
- o Reconciliation of bank and cash balances;
- o Closure of prior-year accounts; and
- o Procurement of relevant books and implementation of a financial cost system.

Fixed asset inventories have been completed and values set where possible. However, with 1985 accounts not written up even at the date of this report, complete valuation and reconciliation cannot be completed. Additionally, attention was drawn to assets existing at abandoned locations, all of which were in good condition and should be retrieved. To date, no action has been taken.

Omission of the calculation of accumulated depreciation on fixed assets listed precludes the completion of Fixed Assets Cards for distribution to areas, and further precludes the effective assignment of fixed assets numbers to property.

Stipulations were laid down for the commencement of general and spare parts inventories at all areas. Areas have responded with their lists, but Accra Office inventories are incomplete. Valuation of spare parts has not been undertaken and, therefore, a cost accounting system is inoperative.

Physical inventories of all seed were finally completed in all areas, after initial confusion caused by lack of precise instructions. Seed at sales kiosks had been considered "sold" and

ignored. Also stores had ignored seed processed because processing facilities had not waybilled production to them although the seed was effectively in their hands.

Valuation of seed inventories has not been completed because 1985 accounts were not written up and, hence, cost data cannot be extracted.

Verification of Accounts Receivable has not been completed.

Verification of Accounts Payable has not been completed because the accrual system of accounting was not practiced within the company. In this regard, it was noted that the Winneba Plant owed the Electricity Department the sum of ₵2,382,381.29. This liability had not been recorded at December, 31, 1985. Winneba plant incurs a standing charge of ₵413,151 per month.

Closure of prior year accounts is not complete. This affects all the points made in preceding paragraphs. Additionally, closure of prior year accounts should not be made until information has been received through liaison with the Ministry of Finance of GOG expenditure on the GSC.

Winneba and Kumasi's prior year accounts should not be closed until the cash discrepancies detected have been resolved.

Winneba appears to be the only area without adequate books. Purchase will have to be made in Accra as the Winneba area does not possess a local supplier.

These controllable circumstances preclude effective operation of the Financial and Cost Accounting System. The responsibility for this delay falls on the Accra Accounting Department and Chief Accountant.

Areas cannot operate the system, and be decentralized, without the opening balances all of which are held in the Accra office books. Failure to write-up the 1985 accounts will further delay effective area operations and cause an undesirable backlog of work. It would have been desirable for all areas to possess full accounting information. In this manner, area accountants and accounting assistants could have been helped with dry-runs prior to the financial cost accounting system coming on full stream.

Figure III-1 illustrates the type of request made, request date, the current situation at date of this report, and the effect of non-completion on the GSC's accounting system.

**FIGURE III-1. STATUS OF OUTSTANDING REQUESTS PREREQUISITE TO
ON - GOING SYSTEM OF FINANCIAL AND COST
ACCOUNTING AS AT MARCH 10, 1986**

| ITEM | REQUEST DESCRIPTION | DATE REQUEST MADE | STATUS OF WORK | EFFECT OF WORK STATUS |
|------|--|---|---|--|
| 1 | IDENTIFICATION OF ELEMENTS OF SECOND SEED PROCESSING PLANT LOCATED AT DOWNTOWN WINNEBA STORES AND ADJACENT TO WINNEBA PLANT WAGON - DRYERS | SEPTEMBER 1985 | UNTOUCHED | AFFECTS AND DELAYS FIXED ASSET RECONCILIATION AND COST ACCOUNTING |
| 2 | COMPLETION OF FIXED ASSET ACQUISITIONS 1984 AND 1985, INCLUDING GRANA GOVT. EXPENDITURE | REPEATEDLY | NO-APPROACH | DELAYS FIXED ASSET RECONCILIATIONS, DEPRECIATION SCHEDULES, 1984 AND 1985 FINANCIAL RESULTS, FIXED ASSET CARD COMPLETION, AREA DECENTRALIZATION, AND BALANCE SHEET |
| 3. | INCORPORATION OF USAID LOANS FOR EQUIPMENT PURCHASES FOR INCORPORATION IN FIXED ASSET RECORDS | REPEATEDLY | INCOMPLETE | AS ABOVE |
| 4. | COMPLETION OF FIXED ASSET DEPRECIATION SCHEDULES TO DECEMBER 1985 | REPEATEDLY | INCOMPLETE DUE ITEM #2 AND 3 | DELAYS FIXED ASSET RECORDS, COST ACCOUNTING, AREA DECENTRALIZATION, 1984 AND 1985 FINANCIAL RESULTS: |
| 5. | COMPLETION OF FIXED ASSET CARDS | REPEATEDLY | UNTOUCHED DUE ITEMS # 2,3,4 | DELAYS FIXED ASSET CONTROLS, DECENTRALIZATION, AND COST ACCOUNTING |
| 6. | INVENTORY OF SPARE PARTS IN ACCRA STORES | SEPTEMBER 1985 | INCOMPLETE AS RECEIVING BAY AND CASES IN WINNEBA STORES NOT DONE | DELAYS AREAS STORES ACCOUNTING COST ACCOUNTING, STORES INVENTORY CONTROL, AND DECENTRALIZATION |
| 7. | RETRIEVAL OF TRACTOR SPARES AT ABANDONED KPONG FARM AS WELL AS RICE THRESHER, FILING CABINET AND FILING CUPBOARD | JANUARY 1986 | NO-APPROACH | DELAYS FIXED ASSET RECORDS AND INVENTORY COMPLETION |
| 8. | VALUATION OF ALL AREA INVENTORIES, INCLUDING SEED IMPORTED | SEPTEMBER 1985 AND REPEATEDLY | INCOMPLETE | DELAYS DECENTRALIZATION, COST ACCOUNTING, AND INVENTORY CONTROLS |
| 9. | VALUATION OF ACCRA OFFICE GENERAL AND SPARE PARTS | FIRST APPROACH SEPTEMBER 1985 AND THEREAFTER REPEATEDLY | NO-APPROACH | DELAYS STORES INVENTORIES CONTROL, FINANCIAL STATEMENT 1985, BALANCE SHEET AND COST ACCOUNTING |
| 10. | ACCOUNTING FOR VARIOUS ITEMS OF EQUIPMENT IMPORTED UNDER USAID LOAN ARRANGEMENT | SEPTEMBER 1985 | INCOMPLETE | DELAYS FIXED ASSET RECONCILIATION AS AT DECEMBER 31, 1985, AND DECENTRALIZATION |
| 11. | CUT STENCILS FOR FORMS | FEBRUARY 2, 1985 | UNTOUCHED | DELAYS COST ACCOUNTING AND FINANCIAL RETURNS |
| 12. | AUDIT OF CASH SALES/BANK DEPOSIT DIFFERENCE AT KUMASI AREA | APRIL 1985 | UNTOUCHED AT INTERNAL AUDITOR | PRELIMINARY APPROACH BY ACCOUNTANT, NO ACTION BY INTERNAL AUDITOR, AFFECTS FINANCIAL RESULTS |
| 13. | DETERMINATION AND ACTION ON CASH DISCREPANCY FROM 1984 AT WINNEBA AREA | OCTOBER 1985 | INCOMPLETE ACCOUNTANT REPLACED | AFFECTS 1984 FINANCIAL RESULTS |
| 14. | PURCHASE OF ACCOUNTING AND STORES LEDGERS | DECEMBER 1985 | INCOMPLETE AT ALL LEVELS | AFFECTS WRITE-UP OF ACCOUNTING TRANSACTIONS, CAUSING DELAYS IN COST ACCOUNTING AND FINANCIAL STATEMENT SUBMISSION |

A. Problems of Management and Accounting Control

1. Fixed Assets

Fixed Asset inventories revealed a total lack of control over movements and thus over the assets themselves. Assets were transferred, loaned to other parties, or scrapped all without advice to the Accounting Department. In these circumstances it is doubtful if fixed asset records, had they been properly maintained, would have provided anything more than a base upon which to work.

Reconciliation of Fixed Asset inventories to the General Ledger Account proved time consuming due to a lack of a system of asset numbering (see Accounting Manual). Valuation was eventually completed and Fixed Asset schedules handed over for depreciation calculations. However, due to GOG expenditure on asset acquisitions not having been included in the books for the years 1980-85, completion of Fixed Asset schedules to reflect total assets is in abeyance. The importance of recording GOG expenditures and writing up the books to December 1985 for final asset valuation and reconciliation has been repeatedly emphasized. Until this is done, the completion of fixed asset cards at area levels will be delayed and with it hopes of effective control.

There has been a lack of management control over assets which is illustrated by the discovery of machinery, equipment and spares--some still in unopened cases--abandoned on farms. In discussions with individual managers, it was apparent that they did not understand the importance of asset accountability.

2. Seed Inventory

Seed inventories proved to be little different than the problems related to fixed asset control. In every case, sales kiosks inventories were considered "sold" and ignored. On processed seed, there was no effort to relate gross input to output of seed. Seed spillage was ignored and swept away. Spillage was considered to have no value. In warehouses the position was no different. Torn bags were not repaired promptly and bags spillage was very apparent. Spot checks at the Winneba Plant showed a lack of control over stock moving out of the premises.

There was no gate check for movement authority nor examination of loads. Spilled seed could easily be removed without hindrance. At areas without a processing plant and where reliance is placed on sun-drying, chickens were seen feeding on seed.

Mention has been made of an area inventory return showing:

| | |
|-----------------------------------|--------------|
| Heavily weeviled, partially caked | 108 minibags |
| Losses due to mice | 63 minibags |
| Total | 171 minibags |

If a conservative cost of ₵2,500 per bag was taken, the value attached to the 171 bags is ₵427,500. The value of 728 bags "low germ not weeviled" would be ₵1,820,000. The value attached to low-germ vegetable seed shown in Appendix A is ₵1,160,569 while that of 1983-84 maize seed is ₵12,077,500.

3. Spare Parts Stores

Stores accounting has not formed as part of the accounting system and thus has not been shown in the assets of the Company with reflection in capital invested.

A request was made in September 1985 for an inventory to be taken. This commenced in December 1985. At the date of this report, the inventory is incomplete with the receiving bay and Accra stores in Winneba still untouched. No valuation has been attempted.

The fact emerged from the inventory of the high level of spares held. This has led to congestion in a very restricted space. There is no room for more spares in the present allocated space. See Recommendations.

If immediate attention is not given to a valuation of spare parts inventory, the cost accounting system and the level of needed management and financial control will not be obtainable.

No stores ledgers are maintained in the Accra office stores where the majority of spare parts are held. No attempt has been made by the Accra Accounting Department to acquire stores ledgers.

The lack of physical and monetary control over the stores is a major weakness of the GSC and requires senior management's urgent attention in the immediate future. Staff members who frustrate this control must be removed.

The Accra office includes a spare part store and a general store. Both stores are on the ground floor of the building. The general store has a sub-store at the Beach sales office to which frequent visits are made to withdraw supplies. With areas decentralized effective January 1, 1986, it is recommended that the two-store system be reduced to one main store with a store-keeper and assistant. The ledger work of both stores can be handled by one man. Combination of the two stores will require elimination of the Beach sales office stores where consumables

are kept. Maintenance of the Beach sales office stores is wasteful of manpower and vehicle usage. There will be the usual objections of impracticality as personal empires are threatened, but such protests should not be permitted to frustrate the management process of effective control.

B. The Current Staff Situation

There has been a move to upgrade accounting staff since the report of September 1985. A new accountant has been appointed to Kumasi area with the former incumbent becoming an assistant. The assistant requires considerable training and may not be able to achieve the level of efficiency required.

A new accountant has been appointed to the Winneba area, replacing the incumbent who is on transfer to Accra. This individual will make no useful contribution to the Accra Accounting Department.

The Ho Area Accounting Assistant has had no accounting training but is eager and willing to learn. Training must be provided if he is to progress in his work. Modification of the Accounting office is needed as severe congestion exists and affects efficiency.

Accounting skills are strongest in the Tamale and Bolgatanga area. Nevertheless, unless leadership and guidance is supplied, this strength may prove to be the Company's loss.

Junior staff in Accra are essentially trainable and failure to undertake this task, initially by means of rotation of duties, will result in a gradual deterioration in output and a sense of frustration. Every encouragement should be given to attendance at courses and further studies.

Guidance and leadership have been totally absent. Junior staff have not been supported in their efforts to resolve missing returns and this has had a detrimental effect on updating the financial results. Until mid-1985 no attempt had been made to reconcile available sales returns to cash deposited in banks. Once guided in their work, staff response was good.

C. Accounting Procedures

Accounting procedures and the establishment of guidelines were absent in the Ghana Seed Company. Forms in use did not provide the means to prove correctness of data. No attempt has been made to balance accounts and verify entries. As a result, in 1984 the cash account showed more cash expended than had been received. It would have been expected that this discrepancy would have caused management to order an immediate investigation of all returns; they did not.

D. Financial Accounting

The accounting system was subjected to a series of tests and the response time measured throughout the period of the assignment. Results were completely unacceptable. The situation within the Ghana Seed Company's head office accounting group should give management cause for concern. The obligation of the accounting group to supply management with up-to-date information on the financial situation of the organization and to maintain the accounts on a day-to-day basis is ignored. To be able to meet these obligations, guidelines must be established, deadlines fixed, leadership and guidance provided, and staff trained in their duties. Continued staff training in all phases of accounting work is essential if opportunities for advancement are to be provided. None of these requirements exist at this time. At best, the new accounting manual will serve to establish the guidelines, fix deadlines for compliance with financial return requirements, and generally guide and establish the basis for internal controls. To be effective, the system must be monitored.

Good controls will highlight losses and establish their cause and direct managerial attention to them for corrective action. In the initial stages, management will go through a period of education as they make use of accounting information for the betterment of their operation. Essential to this process of managerial education is strong financial leadership.

E. General Problems of the Accounting Department

The accounting department lacks strong, qualified, experienced, professional leadership. The lack of qualified professional leadership is manifest in the state of the accounting records and in the total lack of control over fixed assets and inventories as well as over accounts receivables. This situation works to the detriment of the company and must be remedied.

Throughout the investigation of operations, it was apparent that there is an acceptance of results without an investigation into variances from acceptable norms. Budgets are not used as a management tool.

Investigation of accounting returns relating to sales showed that accounting forms did not reconcile opening seed inventories, receipts and issues, to closing inventory balances; nor was the issues (or sales) of seed inventory reconciled to cash deposited. The climax of the investigation came with the discovery of a drawer in Winneba area office containing a year's weekly cash sales summary and deposit slips which had never been supplied to the Accra Accounting Department, and which effec-

tively refuted any manifestations of adequate control over seed inventory. This discovery in turn led to the reconstruction of the cash account and produced a cash discrepancy.

In the Kumasi area sales office cash sales did not agree with cash banked. The cash discrepancies were drawn to the attention of management and internal audit in April 1985. No action was taken. External auditors missed the discrepancy.

F. Internal Audit

The internal auditor is not doing an effective job for the company. He is not confining himself to the internal auditing function which is of prime importance if effective control is to be exercised over the operations. Where audits are made, far too much time is involved and basic operating flaws have not been detected.

The internal auditor must be a professional. He need not be too strict; must be able to work logically throughout the audit operation by a system of checks and counter-checks; and must never be too friendly as this can numb his perceptiveness. He must wear the mantle of professional respectability and have the ability to lodge a strong protest to management an incumbent is granted long leave where a cash discrepancy has been ascertained.

No attempt has ever been made in the internal auditing function to verify assets of the company. No attempt has ever been made to verify insurance coverage to asset value.

The internal auditor has not observed the loss of cash income to the company through spillage being treated as waste and discarded. He has not commented on storage facilities and the controllable loss to the company of weevil attack and caking. It is doubtful whether this would have resulted in any effective management action but it remains his duty to do so just as it is his obligation to verify inventories to sales, to cash received, to cash deposited, and to pursue discrepancies vigorously. To fail to do so is to negate his responsibilities.

Under the present circumstances, given the state of the accounting records, it is not possible for management to judge the efficiency of cost effectiveness of current company operations individually or as a whole. Management is immobilized in its ability to form an accurate assessment of the seriousness of operating problems which could arise. Lacking is both the financial education and means to recognize such problems in a timely manner which is of crucial importance to effective management. The truth is that, even in a moment of financial

crisis, there has been no insistence on prompt financial information. Indeed, given the current financial leadership situation, even if insisted upon, this information may not be attainable.

With the Ghana Seed Company's management emphasis on agriculturists and technicians, it has been noted that in the area of financial management and appreciation of the inter-relationship of costs, the Company is floundering through lack of required expertise. It is the obligation of the financial management to provide headquarters top and area management with a true and timely appreciation of where the company is going and what has to be done to get it on the right track. Given this information, management must demonstrate an ability to act decisively. To this date, management has not demonstrated its ability to act. Consequently, management definitely will not be able to act on problems if financial reports, such as shown in Appendix B, are the type of financial expertise which they can rely on to assist them in tackling the problems.

Management education, as well as accounting education, at all levels, is a prerequisite for effectively dealing with the problems of the Ghana Seed Company. The importance of this need cannot be over-emphasized and compliance should be one of the prerequisites for further aid to the company.

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IV. FINANCIAL AND MANAGEMENT CONTROL WITHIN THE GHANA SEED COMPANY

Tables IV-1, IV-2, and IV-3 illustrate:

- o Comparative income statement 1980-1984
- o Comparative income statement 1980 and 1981; with actual 1982 compared to budget 1982
- o Comparative income statement 1983-1984 with budget estimates 1985 and 1986

No figures are available for 1985 as entries have not been completed and inventory positions have not been established in monetary terms.

From 1980 to 1984, the Company has made consistent losses rising from ¢225,937 in 1980 to ¢39,284,305 in 1984. Losses to 1984 total ¢55,867,269 and may reach ¢90,000,000 by December 1985. With current 1986 projections of a loss of ¢49,826,058, total losses would exceed ¢130,000,000 by the end of 1986.

One cause is the substantial increase in salaries ordered by the GOG in 1986 which results in salaries exceeding sales projections. This type of situation requires deep analysis of all categories of expense and the exercise of tight control. There has been no attempt to exercise this control, there has been no visible effort to maximize sales by effective marketing strategy.

Budgeting is not used as a management tool within the Ghana Seed Company.

Close of year inventories compared to budgeted and sales achieved provide an interesting insight into the level of management control and their understanding of cost effects:

| <u>Year</u> | <u>Actual</u> | <u>Budgeted</u> | <u>Sales Achieved</u> |
|-------------|-----------------|-----------------|-----------------------|
| | -----Cedis----- | | |
| 1982 | 6,160,046 | 7,950,000 | 31,169,828 (18 mo.) |
| 1983 | 53,183,686 | 9,250,000 | 23,725,636 |
| 1984 | 30,288,630 | 116,100,000 | 34,028,705 |
| 1985 | | 105,550,250 | 77,097,722 (Budget) |
| 1986 | | 55,034,900 | 52,054,000 (Budget) |

TABLE IV-1. COMPARATIVE PROFIT AND LOSS ACCOUNT 1980 (CEDIS)

| | 1980 | 1981 | 1982 (18 months) | 1983 | 1984 | 1985 |
|---|-----------|------------|------------------|--------------|--------------|------|
| SALES | 4,984,494 | 12,810,685 | 31,169,828 | 28,725,636 | 34,028,705 | |
| LESS COST OF SALES | 2,225,557 | 7,131,749 | 17,391,722 | 17,654,702 | 46,032,058 | |
| GROSS MARGIN | 2,225,557 | 5,678,936 | 13,778,106 | 6,070,934 | <12,003,353> | |
| GROSS MARGIN % | 55.35% | 44.32% | 44.20% | 25.59% | | |
| OTHER INCOME | - | - | 45,565 | - | 3,300 | |
| MARGIN BEFORE EXPENSES | 2,758,937 | 5,678,936 | 13,823,671 | 6,070,934 | <12,000,053> | |
| WAGES AND SALARIES | 2,246,790 | 3,414,925 | 8,683,909 | 7,666,533 | 9,693,398 | |
| RENT | 7,800 | 48,976 | 179,805 | 258,365 | 246,842 | |
| VEHICLE MAINTENANCE | 59,574 | 389,074 | 1,387,415 | 1,095,323 | 1,512,989 | |
| CONFERENCE AND SEMINAR | 8,013 | 4,183 | 154,760 | 56,950 | 171,389 | |
| PRINTING AND STATEMENT | 18,525 | 25,155 | 336,580 | 241,042 | 388,738 | |
| VEHICLE RUNNING | 102,777 | 695,918 | 1,834,789 | 2,683,161 | 3,535,082 | |
| GENERAL EXPENSE | 146,997 | 97,236 | 95,708 | 88,048 | 164,119 | |
| TRAVELLING & TRANSPORT EXPENSE | 148,872 | 402,308 | 1,124,566 | 974,653 | 1,579,192 | |
| EQUIPMENT REPAIRS | 119,741 | 56,053 | 241,420 | 175,070 | 257,070 | |
| EQUIPMENT HIRE | 14,965 | 35,832 | 267,562 | 75,059 | 126,500 | |
| ADVERTISEMENT | 5,146 | 7,647 | 248,404 | 82,515 | 87,761 | |
| BANK CHARGE/INTEREST | 21,475 | 120,713 | 275,726 | 787,832 | 3,679,067 | |
| DIRECTORS FEES | 12,199 | 13,920 | 28,240 | 47,150 | | |
| PROFESSIONAL FEES | 32,000 | 77,275 | 81,625 | 48,000 | 8,000 | |
| LABOURATORY REGISTRATION | 40,000 | 60,000 | 105,000 | 80,007 | 80,000 | |
| INSURANCE | - | 12,134 | 160,457 | 104,637 | 5,000 | |
| General Repairs | - | 16,029 | 202,042 | 72,535 | 118,507 | |
| ENTERTAINMENT | - | 58,683 | 68,675 | 47,318 | 173,339 | |
| MEDICAL EXPENSES | - | 10,636 | 112,976 | 166,397 | 346,187 | |
| STAFF TRAINING | - | 16,241 | 7,258 | 111,783 | 24,734 | |
| FARM RESEARCH EXPENSE | - | 1,200 | 18,435 | 28,340 | 12,514 | |
| POSTAGE AND TELEPHONES | - | 24,115 | 13,156 | 3,929 | 4,893 | |
| ELECTRICITY AND WATER | - | 11,032 | 34,896 | 42,635 | 86,501 | |
| LOOSE TOOLS WRITTEN OFF | - | 109,168 | - | - | - | |
| DEPRECIATION | - | 581,516 | 1,532,894 | 3,177,313 | 4,809,424 | |
| MACHINERY RUNNING EXPENSES | - | - | 50,711 | 103,540 | - | |
| SUBSCRIPTIONS | - | - | 2,278 | 12,350 | 10,062 | |
| COMMISSIONS | - | - | - | 159,997 | - | |
| STORE MATERIALS | - | - | - | - | 149,804 | |
| STAFF WELFARE | - | - | - | - | 10,140 | |
| MISCELLANEOUS EXPENSE | - | - | - | - | - | |
| TOTAL EXPENSES | 2,984,374 | 6,289,969 | 17,249,287 | 18,391,312 | 27,284,252 | |
| % OF SALES | 59.88% | 49.10% | 55.33% | 77.52% | 80.18% | |
| (LOSS) FOR YEAR | (225,937) | (611,033) | <3,425,616> | (12,320,378) | <39,284,305> | |
| % OF SALES | (4.53%) | (4.76%) | (10.99%) | (51.92%) | (115.44%) | |

AT MARCH 10, 1986

NOT AVAILABLE

TABLE IV-2. COMPARATIVE INCOME STATEMENT WITH BUDGET ESTIMATE
YEAR: 1983 TO 1985 (CEDIS)

| DESCRIPTION | 1983 | | | 1984 | | | 1985* | | 1986 |
|---|--------------|------------|--------------|--------------|-------------|---------------|--------|-------------|--------------|
| | ACTUAL | BUDGET | VARIANCE | ACTUAL | BUDGET | VARIANCE | ACTUAL | BUDGET | BUDGET |
| SALES | 23,725,636 | 28,173,200 | (4,447,564) | 34,028,705 | 134,644,000 | (100,615,295) | | 77,097,722 | 52,054,000 |
| LESS COST OF SALES | 17,654,702 | 12,742,300 | (4,912,402) | 46,032,058 | 26,618,750 | (19,415,308) | | 32,118,840 | 15,850,600 |
| GROSS MARGIN | 6,070,934 | 15,430,900 | (9,359,966) | (12,003,353) | 108,025,250 | (120,028,603) | | 44,978,882 | 36,203,400 |
| GROSS MARGIN % | 25.59% | 54.77% | | (35.27%) | 80.23% | | | 58.34% | 69.54% |
| OTHER INCOME | | | | 3,300 | - | - | | - | - |
| MARGIN BEFORE EXPENSES | 6,070,934 | 15,430,900 | (9,359,966) | (12,000,053) | 108,025,250 | (120,028,603) | | 44,978,882 | 36,203,400 |
| WAGES AND SALARIES | 7,646,533 | 5,750,000 | (1,916,533) | 9,693,398 | 13,410,000 | 3,716,602 | | 17,507,760 | 45,460,209 |
| RENT | 258,365 | 250,000 | (8,365) | 249,842 | 201,450 | (48,392) | | 362,700 | 286,410 |
| VEHICLE MAINTENANCE | 1,095,323 | 990,000 | (105,323) | 1,512,989 | 1,081,000 | (431,989) | | 1,993,600 | 2,218,820 |
| CONFERENCE AND SEMINARS | 56,950 | 90,000 | 33,050 | 171,389 | 48,100 | (123,289) | | 307,900 | 306,470 |
| PRINTING AND STATIONERY | 241,042 | 610,000 | 368,958 | 388,738 | 486,280 | 97,542 | | 609,800 | 1,361,340 |
| VEHICLE RUNNING | 2,683,161 | 1,510,000 | (1,173,161) | 3,535,082 | 3,985,900 | 450,818 | | 4,147,600 | 7,259,260 |
| GENERAL EXPENSE | 88,048 | 40,000 | (48,048) | 164,119 | 211,610 | 47,491 | | 207,000 | 554,070 |
| TRAVELLING & TRANSP. EXP. | 974,653 | 980,000 | 5,347 | 1,579,192 | 1,106,320 | (472,872) | | 2,676,000 | 4,367,660 |
| EQUIPMENT REPAIRS | 175,070 | 167,000 | (8,070) | 257,070 | 303,360 | 46,290 | | 620,000 | 1,249,240 |
| EQUIPMENT HIRE | 75,059 | 200,000 | 124,941 | 126,500 | 88,350 | (38,150) | | 369,700 | 23,960 |
| ADVERTISEMENT | 82,515 | 195,000 | 112,485 | 87,761 | 103,450 | 15,689 | | 123,500 | 295,520 |
| BANK CHARGES/INTEREST | 787,832 | 180,000 | (607,832) | 3,679,067 | 3,107,800 | (571,267) | | 4,049,300 | 10,426,180 |
| DIRECTORS FEES | 47,180 | 18,000 | (29,180) | - | - | - | | - | - |
| PROFESSIONAL FEES | 48,000 | 85,000 | 37,000 | 8,000 | 80,000 | 72,000 | | 44,100 | - |
| AUDITORS REMUNERATION | 80,607 | 70,000 | (10,607) | 80,000 | 155,000 | 75,000 | | 80,000 | 170,000 |
| INSURANCE | 104,837 | - | (104,837) | 5,000 | - | (5,000) | | 2,447,000 | 745,110 |
| GENERAL REPAIRS | 72,535 | 190,000 | 117,465 | 118,507 | 106,470 | (12,037) | | 240,100 | 600,190 |
| ENTERTAINMENT | 47,318 | 65,000 | 17,682 | 173,339 | 74,140 | (99,199) | | 244,700 | 590,405 |
| MEDICAL EXPENSES | 166,397 | 180,000 | 13,603 | 346,187 | 202,430 | (143,757) | | 494,300 | 1,075,720 |
| STAFF TRAINING | 111,783 | 10,000 | (101,783) | 26,734 | 134,850 | 108,116 | | 65,000 | 82,915 |
| FARM RESEARCH EXPENSES | 28,340 | 45,000 | 16,660 | 12,514 | 18,336 | 5,822 | | 42,200 | 12,575 |
| POSTAGE AND TELEPHONES | 3,929 | 18,000 | 14,071 | 4,893 | 3,400 | (1,493) | | 10,800 | 2,100 |
| ELECTRICITY AND WATER | 42,635 | 30,000 | (12,635) | 86,501 | 50,690 | (35,811) | | 133,800 | 1,050,950 |
| LOOSE TOOLS WRITTEN OFF | - | - | - | - | - | - | | - | 247,500 |
| DEPRECIATION | 3,177,313 | 1,425,000 | (1,752,313) | 4,809,424 | 1,273,230 | (3,536,194) | | 3,510,300 | 4,809,424 |
| MACHINERY RUNNING EXP. | 103,540 | 80,000 | (23,540) | - | 129,650 | 129,650 | | 81,400 | 1,207,225 |
| SUBSCRIPTION | 12,350 | - | (12,350) | 10,062 | 20,390 | 10,328 | | 64,700 | 63,440 |
| COMMISSION | 159,997 | 60,000 | (99,997) | - | 279,930 | 279,930 | | - | - |
| STORES MATERIALS | - | - | - | 149,804 | - | (149,804) | | - | 1,490,150 |
| STAFF WELFARE | - | - | - | 10,140 | - | (10,140) | | - | 70,815 |
| TOTAL EXPENSE | 18,391,312 | 13,238,000 | (5,153,312) | 27,284,252 | 26,675,050 | (609,202) | | 39,415,260 | 86,029,458 |
| % OF SALES | 77.52% | 46.98% | | 80.18% | 19.81% | - | | 51.12% | 165.26% |
| PROFIT/(LOSS) FOR YEAR | (12,320,378) | 2,192,900 | (14,513,278) | (39,284,305) | 81,350,200 | (120,634,505) | | 5,563,622 | (49,826,058) |
| % OF SALES | (51.92%) | 7.78% | | (115.44%) | 60.41% | - | | 7.21% | (95.71%) |
| CLOSING STOCKS AT YR END | 53,183,686 | 9,250,000 | (43,933,686) | 30,288,630 | 116,100,000 | | | 105,550,250 | 55,034,900 |
| % INCREASE IN CLOSING STOCK OVER BUDGET | (574.95%) | | | 26.08% | | | | | |
| % CLOSING STOCKS TO SALES | 224.16% | 32.83% | - | 89.00% | 86.22% | - | | 136.90% | 105.72% |

NOT AVAILABLE AT MARCH 10, 1986

* Salaries According to new Government scales

TABLE IV-3. COMPARATIVE INCOME STATEMENT WITH BUDGET ESTIMATES
YEAR: 1980 TO 1982 (CEDIS)

| DESCRIPTION | 1980 | | | 1981 | | | 1982 (18 months) | | |
|----------------------------|-----------|--------|----------|------------|--------|----------|------------------|------------|-------------|
| | ACTUAL | BUDGET | VARIANCE | ACTUAL | BUDGET | VARIANCE | ACTUAL | BUDGET | VARIANCE |
| SALES | 4,984,494 | | | 12,810,685 | | | 31,169,828 | 27,001,000 | 4,168,828 |
| LESS COST OF SALES | 2,225,557 | | | 7,131,749 | | | 17,391,722 | 16,600,750 | (790,972) |
| GROSS MARGIN | 2,758,937 | | | 5,678,936 | | | 13,778,106 | 10,400,250 | 3,377,856 |
| GROSS MARGIN % | 55.35% | | | 44.32% | | | 44.20% | 38.51% | |
| OTHER INCOME | - | | | - | | | 45,565 | - | |
| MARGIN BEFORE EXPENSES | 2,758,937 | | | 5,678,936 | | | 13,823,671 | 10,400,250 | 3,377,856 |
| WAGES AND SALARIES | 2,246,790 | | | 3,414,925 | | | 8,683,909 | 4,502,000 | (4,181,909) |
| RENT | 7,800 | | | 48,976 | | | 179,805 | 281,200 | 101,395 |
| VEHICLE MAINTENANCE | 59,574 | | | 389,074 | | | 1,387,415 | 1,180,000 | (207,415) |
| CONFERENCE AND SEMINARS | 8,013 | | | 4,183 | | | 154,760 | 66,000 | (88,760) |
| PRINTING AND STATIONERY | 18,525 | | | 25,155 | | | 336,580 | 716,000 | (379,420) |
| VEHICLE RUNNING | 102,777 | | | 695,918 | | | 1,834,789 | 1,092,000 | (742,789) |
| GENERAL EXPENSE | 146,997 | | | 97,236 | | | 95,708 | 53,600 | (42,108) |
| TRAVELLING & TRANSPORT | 148,872 | | | 402,308 | | | 1,124,566 | 615,000 | (509,566) |
| EQUIPMENT REPAIRS | 119,741 | | | 56,053 | | | 241,420 | 128,000 | (113,420) |
| EQUIPMENT HIRE | 14,965 | | | 35,832 | | | 267,562 | 35,000 | (42,108) |
| ADVERTISEMENT | 5,146 | | | 7,647 | | | 248,404 | 135,000 | (113,404) |
| BANK CHARGES/INTEREST | 21,475 | | | 120,713 | | | 275,726 | 60,900 | (214,826) |
| DIRECTORS FEES | 12,199 | | | 13,920 | | | 28,240 | 13,920 | (14,320) |
| PROFESSIONAL FEES | 32,000 | | | 77,275 | | | 81,625 | | (81,625) |
| AUDITORS REMUNERATION | 40,000 | | | 60,000 | | | 105,000 | 45,000 | (60,000) |
| INSURANCE | - | | | 12,134 | | | 160,457 | - | (160,457) |
| GENERAL REPAIRS | - | | | 16,029 | | | 202,042 | 76,100 | (125,942) |
| ENTERTAINMENT | - | | | 58,683 | | | 68,675 | 46,600 | (22,075) |
| MEDICAL EXPENSES | - | | | 10,636 | | | 112,976 | 34,000 | (78,976) |
| STAFF TRAINING | - | | | 16,241 | | | 7,288 | 1,500 | (5,758) |
| FARM RESEARCH EXPENSES | - | | | 1,200 | | | 18,435 | 47,000 | 28,365 |
| POSTAGE AND TELEPHONES | - | | | 24,115 | | | 13,156 | 11,000 | (2,156) |
| ELECTRICITY AND WATER | - | | | 11,032 | | | 34,896 | 16,500 | (18,396) |
| LOOSE TOOLS WRITTEN OFF | - | | | 109,168 | | | - | - | - |
| DEPRECIATION | - | | | 581,516 | | | 1,532,894 | - | (1,532,894) |
| MACHINERY RUNNING EXPENSES | - | | | - | | | 50,711 | 150,000 | 99,289 |
| SUBSCRIPTION | - | | | - | | | 2,278 | - | (2,278) |
| COMMISSIONS | - | | | - | | | - | - | - |
| STORE MATERIALS | - | | | - | | | - | - | - |
| STAFF WELFARE | - | | | - | | | - | - | - |
| MISCELLANEOUS EXPENSES | - | | | - | | | - | - | - |
| TOTAL EXPENSE | 2,984,874 | | | 6,289,969 | | | 17,249,287 | 9,306,320 | (7,942,967) |
| % OF SALES | 59.88% | | | 49.10% | | | 55.33% | 34.46% | |
| PROFIT/(LOSS) FOR YEAR | (225,937) | | | (611,033) | | | (3,425,616) | 1,093,930 | (4,519,546) |
| % OF SALES | (4.53%) | | | (4.76%) | | | (10.99%) | (4.05%) | |

Inventories require servicing and for the years 1982 to 1986 actual bank charges interest and projections for 1986 are as follows:

| | (Cedis) |
|----------------|------------|
| 1982 | 275,726 |
| 1983 | 787,832 |
| 1984 | 3,679,067 |
| 1985 <u>1/</u> | 4,049,300 |
| 1986 <u>2/</u> | 10,426,180 |

1/ From bank statements
2/ Projected

Not all of the 1986 projections relate to inventory servicing but equally to costs which exceed the margin on sales.

Bank overdrafts have increased from Ø39,942,604 in December 1984 to over Ø50 million in the current period. This is reflected in the budgeted interest charges. The operation is not able to maintain this level of interest charges and turn a profit. At the same time, the level of overdrafts does reflect the extent to which the Company has lost its capital investment through bad management of operations.

The budgeted expenses for 1986 do not reflect electricity charges for the Winneba plant, for which standing charges alone amount to Ø413,151 per month or approximately Ø5 million per year. Variable consumption charges would only arise in the month of operation and with minimal charge during the balance of the period. Likewise, depreciation charges do not include depreciation applicable to the Winneba plant.

The primary cause of the financial situation of the Ghana Seed Company was a speculative build-up of seed inventories starting in 1983, with a purchase price of certified seed grossly in excess of the consumer prices. There has been no market intelligence since then to warn management of threatened changes in demand and the company has adopted its stance on a sellers market when indeed a perceptible shift to a buyers' market had taken place. Thus, with a glut of maize in the market consumer prices fell, the company was faced with an overstock position and seed deterioration. The main emphasis of management has, lamentably, been short term gain rather than long term.

Like all troubled companies, the approach to marketing and sales is weak. This is illustrated by a comparison of advertising to sales in the period 1980 to 1984. Budgeted advertising expenses are shown for 1985 and 1986.

| <u>Year</u> | <u>Advertising</u> | <u>Sales</u> |
|-------------|--------------------|--------------|
| | -----Cedis----- | ----- |
| 1980 | 5,146 | 4,984,494 |
| 1981 | 7,647 | 12,810,685 |
| 1982 | 248,404 | 31,169,828 |
| 1983 | 82,515 | 23,725,636 |
| 1984 | 87,761 | 34,028,705 |
| 1985 Budget | 123,500 | 77,097,722 |
| 1986 Budget | 295,520 | 52,054,000 |

On the basis of past management experience, the budgeted expenses for 1985 and 1986 will not be achieved. This is the first expenditure which will be axed, instead of expenses for conferences and seminars and which expenditure is totally controllable. Marketing does not occupy an important niche in management's strategy.

The situation as evidenced by Tables IV-2, IV-3, and IV-4 calls for an overall review with all managers to investigate, eliminate, or minimize expenditures as well as evolve a strategic plan to approach the problems confronting the company. This calls for a level of expertise in the financial area which the Company does not possess, and a standard of decision-making which is not currently available.

A crucial problem of management and financial control will remain, that of making a realistic assessment of sales objectives within the restricted parameters of profit needs. There will be a need for greater cost consciousness and which even in the dire straits found at this time is inexplicably absent. There is no understanding of the simple fact that unless sales personnel receive top priority in the allocation of vehicles, they will be unable to effectively reach customers at the right time. Sales is an ongoing effort throughout the year.

Sales and cost control are the two important areas on which the Company's future depends. Marketing is the most important and in this effort, is sadly lacking. The Company must adapt itself to a buyer's market. It must go out and seek business and not expect demand to come knocking at its doors.

When cost control is exercised, it falls on the wrong expense--non-purchase of engine oil and fuel--which is necessary to achieve a higher level of sales. Instances have been noted where fuel has not been purchased for vehicles for sales effort.

With the decentralization of accounting, the issuance of the accounting manual, and the design of forms for management control of their operations, a measure of improvement should become

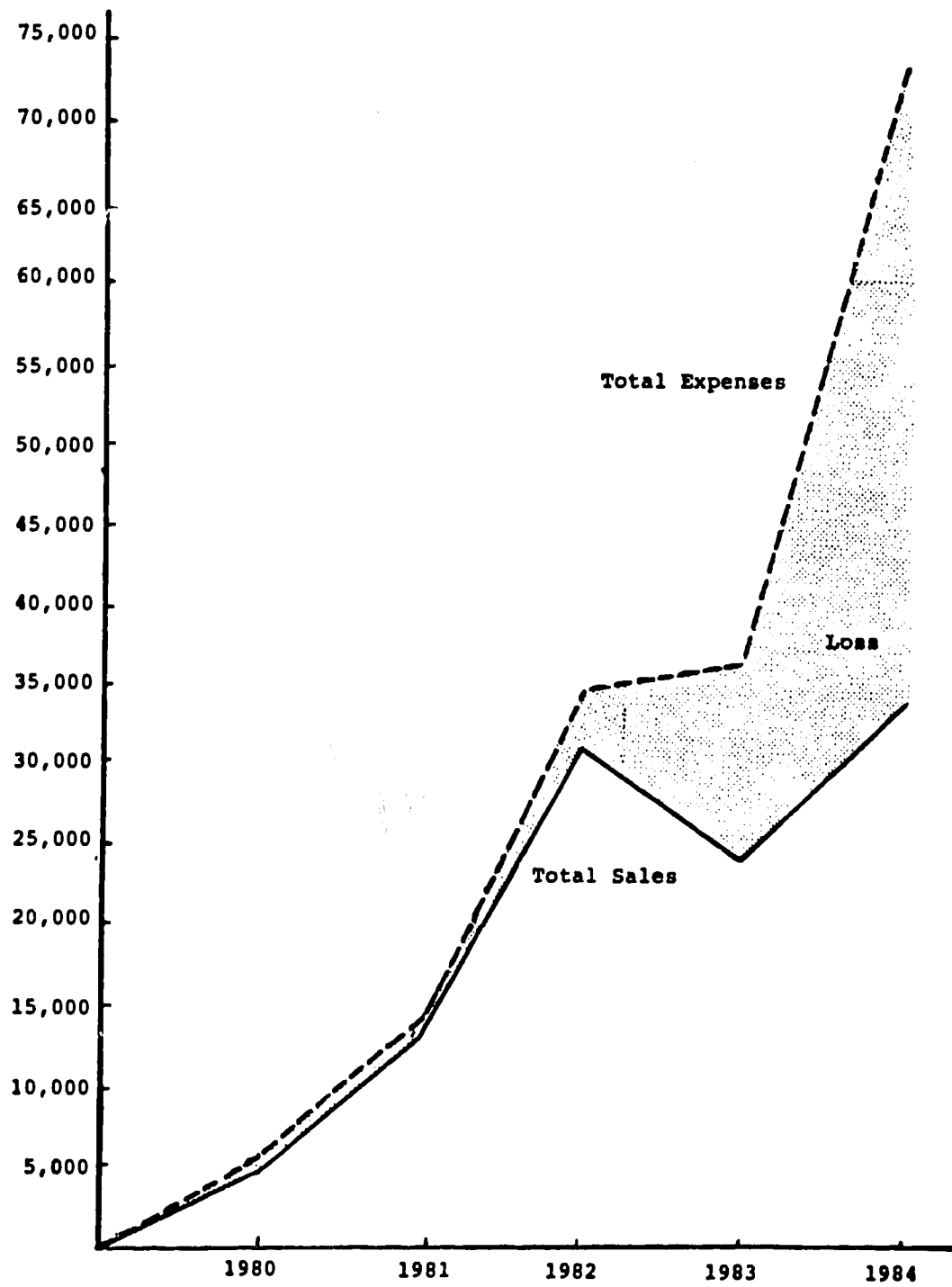
apparent. This is only possible if management is educated in cost accounting techniques and guided by discussions of monthly operating results. This will not be possible because of the lack of accounting expertise and guidance within the Company. This aspect will be dealt with under restraints.

Management continues to demonstrate a lack of flexibility in rapidly changing conditions and there is a lack of urgency in the decision-making process.

Graphic illustration of operating results is not practiced and for which reason the results illustrated in Figure IV-1 is completely lost to management at all levels. The situation obviously calls for a management audit, and a critical assessment of Company operations, and deep analysis of all categories of expense. A revamping of the organizational structure is a sine-gua-non for successful continued operation.

FIGURE IV-1.

COMPARISON OF TOTAL SALES AND TOTAL EXPENSES
1980 - 1984



V. MANAGEMENT PRACTICE--ALERTNESS TO SALES OPPORTUNITIES

In the report of the Ghana Seed Company issued in September 1985, mention was made of the Akumadan Vegetable Seed Processing Plant and its availability to the company if interest was manifested.

Continual currency devaluation will cause a point to be reached. The average farmer with restricted financial resources will find the cost of imported seed expensive, without a corresponding increase in the price of his product. The situation warrants greater company involvement in vegetable seed production and processing. There has been no evidence of company interest in this, although sales of vegetables seed have provided needed cash for the Company's operation in times when maize and paddy seed sales have ground to a stop. Unfortunately, as long as free seed is supplied through international loans, this will retard any initiative by the Company to produce and process its own vegetable seed. The only instance where a small beginning had been made is in Hot Peppers and Garden Eggs but there is ample evidence of opportunities in other varieties and in which indigenous production and processing will amply reward the Company. Nevertheless, the existence of approximately two years inventory of imported vegetable seed, will stifle any initiative on the Company to enter this field of local production. Although, the opportunity exists in the Akumadan Tomato Growing Area to select seed tomato from growers and process it.

The main seed crop sales of the Company are restricted to approximately three months in the year. During the remaining months of the year, the Company continues to bear the full cost of salaries and related idling expenses without any cash inflow other than from vegetable seed mentioned. Where lay-offs cannot occur for political and social reasons, the situation calls for an investigation by which continuing income may be generated. An approach would be a one-stop sales office where farmers could obtain not only seed but implements, product advice, fertilizers, and insecticides. Insecticides and fertilizers need not incur a cash outlay, as these could be obtained on a consignment basis. The outlet must be staffed with agricultural extension personnel, capable of assisting farmers and establishing rapport.

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VI. INSTALLATION OF FINANCIAL AND COST ACCOUNTING SYSTEM

The approach to recommendations of a financial and cost accounting system for a company, requires an indepth study of a company's operation of those areas which illustrate lack of adequate controls and affect the health of the company. Some areas invariably involve detailed analysis of the situation. A system in itself will not solve the problems of a sick company. It must provide the tools by which the cause of the sickness can be isolated, controlled, and eventually, eliminated. Forms provide the basis for control but for these to be effective and operable a staff must exist.

The initial report by this consultant, "A Study of the Problems of the Ghana Seed Company and Recommendations on Cost Ascertainment and Cost Control" dove-tailed, with devising the system appropriately to the company and the accounting manual. Problems which were encountered in the study illuminated the areas as weaknesses and suggested the forms and instructions. Many weaknesses stemmed from managerial weakness from inception. The use and support of agriculturalists and technicians to run a commercial operation without prior guidance, experience and formal education for the purpose; and the lack of strong, experienced, qualified financial professionals on the GSC staff, to provide leadership is the root cause of the problems of the organization. For this reason, the approach to the accounting manual was to provide educational data in the role and function of an accounting department, and support the financial and cost accounting system. The devising of the system, and a hurried introduction, will not resolve the problems overnight. The introduction of a system within the constraints of time available limits effecting monitoring, continued education, and troubleshooting--which are essential to an ongoing smooth running system.

Everything possible was done within the constraints of time. The situation found within the Ghana Seed Company was never a one-year all-intensive task. Two years is the minimum period for such a task.

Preliminary introductions to the system have been conducted throughout the area offices. Without changes in the Head Office Accounting group, there will be no guidance or leadership of the accounting group of the company. The constraints here are qualified staff.

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VII. RECOMMENDATIONS

These recommendations are additional to those made in the initial report on the Ghana Seed Company and should be read in conjunction with this.

Major changes must be made in the Head Office Accounting Department. The Chief Accountant has neither the experience, leadership ability, nor the professional qualifications necessary to head up the department. An unqualified individual should never have been selected for this position. He should be replaced by a person with professional qualifications, leadership ability, and experience. This person should assume the position of Controller (Finance and Administration). The urgency of the Chief Accountant's replacement cannot be overstressed.

The level and quality of internal auditing within the company is weak. Tasks are not performed and too much time is taken to perform a simple audit. The problem arises from both the lack of professional qualifications and professional interest. Given the operating conditions of the Company, the Internal Auditor should be replaced with a professionally qualified auditor who should head-up the Internal Audit Department as envisaged in the initial report on the company. A weak auditing arm is a luxury the company cannot afford. There is a lot that can be accomplished and over a wide area. The position requires extensive traveling due to the quality of the staff in all areas. During the year this consultant was in the Accra Office, the internal auditor made no effort to audit the Head Office, nor has he made any effort to verify the Fixed Assets of the Company nor the stores movement--an area in which the Company is particularly exposed to loss.

There should be no further delay in bringing the stores system into the Financial Department. The lack of an adequate stores system, as laid down in the Accounting Manual, results in an understatement of operating costs. Storekeepers at the head office need training. This was impossible to conduct in the time available. Because of the absence of ledgers, delays in completion of inventories were encountered, and still had not been completed as of March 21. The two stores--the Spare Parts Store and the General Store with its sub-store at the Beach sales office--should be brought together under one Chief Storekeeper and his assistant. The Sub-store at the Beach should be closed down. In a centralized operation such as referred to below, this will result in streamlining the stores system and a reduction in staff.

The Accountant at the Head Office shows promise and is trainable. However, he performs weakly because of the quality of leadership of the department and the tasks which he is called upon to undertake. He requires a minimum of two years intensive training in financial and cost accounting, and he should be encouraged to seek professional qualifications. This will only be possible if he undertakes professional studies.

All accounting staff require training and this is an area which has been totally ignored in the company. Training and leadership will improve the standard of work within the department. In the time available, it was impossible to undertake any training of the junior staff. Rotation of duties in order to improve expertise is not being carried out.

Replacement of the Chief Accountant should coincide with the engagement of a hands-on consultant offering expertise in the financial and cost accounting areas and with the additional responsibility for staff training and trouble-shooting. This assistance to a newly engaged Controller will pay dividends as it will permit the new incumbent to obtain reorientation in the problems of the Company without the extensive duties in which the consultant would engage. To be truly effective the consulting period should cover 18 to 24 months. Preferably the consulting period should begin before the end of a financial year and end at least six months after a full financial year.

In the report on the Ghana Seed Company of September 1985, mention was made of the involvement of the Personnel Manager in importation and clearance of goods. It was recommended that the registration of import documentation and their control should become a function of the Accounting Department. This recommendation is repeated. Tests made on the handling of importations indicate a lack of control inasmuch as it is difficult to trace goods once they have been cleared.

The Head Office staff should be trimmed. A perusal of the budget for 1986 indicates the development of a serious situation. A reduction of overhead is necessary. It is difficult to justify the existence of a head office of current size. Considerations should be given to the elimination of the Accra Head Office and its reconstitution as a smaller, more viable body within the confines of the Winneba Plant. This is where the major investment is and it should receive greater management consideration. Such a move would require a decision on the following positions:

Winneba

Area Manager
Processing Manager
Quality Control
Storekeepers
Workshops

Accra

General Manager
Processing Coordinator
Quality Control
Storekeepers
Workshops

:
In any reconstruction at the Winneba plant, it is suggested that the elimination of the following positions would arise:

| | |
|------------------------|--|
| Area Manager | Functions to be taken over by General Manager assisted by the Assistant Area Manager. |
| Processing Coordinator | The better qualified person to assume processing duties at Winneba plant and also act as coordinator. |
| Quality Control | The elimination of one of the laboratories, technician selecting the best trained, to head-up the new laboratory. |
| Storekeepers | The transfer of the Head Office Accra Stores to Winneba and where there is an overflow of Accra Stores at the moment, would result in bringing all the two main Stores under one Chief Storekeeper and eliminate staff. |
| Workshops | There can be no reasonable justification for having a Workshop in Winneba and another in Accra; one main workshop situated in Winneba should be able to handle such work as was envisaged for the Accra workshops. A combined workshop would result in economies in equipment and personnel. |

Such an amalgamation would also effect more efficiency in the use of the accounting personnel. There would also be economies in registry personnel and secretarial, as well as in nightguards.

Any such amalgamation of offices should not permit the payment of commuting allowances to Winneba plant. An obligatory change of residence would be required.

The Company should file its income tax returns with the authorities. No income tax returns have been filed since the company was formed. At the current time, it stands to lose the benefit of loss carryforwards.

The Research Manager conducts no research but is responsible for the Mile 38 Farm which is essentially involved in foundation seed propagation. If he were engaged in vegetable seed propagation and selection, there would be a justification of his posi-

tion as this involves original work. He should be positioned nearer to Mile 38 and with residence at Kpong. He cannot do an effective job residing in Accra.

The recommendation on the amalgamation of the head office with the Winneba plant requires some painful decision making, but this is necessary in the current economic situation of the Ghana Seed Company. If costs are to be reduced and duplicate functions must be eliminated. This recommendation does not alter the proposed organizational structure outlined in the report of September 1985. The sectors will remain.

Given the situation in the Accra Head Office Stores--the main Stores office of the Company--and the recommendation of its total removal to the Winneba Plant, it is recommended that no further AID importations of General Spares and equipment be made until the following problems have been resolved:

- o Completion of a complete valuation of current inventories;
- o Integration of the Stores System within the Financial Accounting System with set-up of Stores Ledgers and control laid-down in the Accounting Manual;
- o Adequate training of staff in the discharge of their duties;
- o Establishment of proper General Spare Parts Stores at the proposed main Stores at Winneba Plant.

Continued General Spares and equipment importation to the current inadequate and congested facilities, without proper accounting, exposes both the Company and AID to loss and should not be countenanced whatever the arguments on lack of spares availability for operations. The fact is that the Company has no control over its stores operations and has no idea of what it holds in stock broken down into general categories. It has not been able to differentiate between obsolete spares and slow-moving spares nor what is available and crucial to its operations. This important aspect of management control has been totally ignored due to situation in the Accounting Department and its inability to guide and advise top management.

VIII. FINALE

As we look back upon the work of the last twelve months, the words of Rudyard Kipling come to mind:

"And whatsoever we do, we shall fold our hands
and suck our gums and think well of it.
Yes, we shall be perfectly pleased with our work,
and that is the perfectest hell of it!"

9144A

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APPENDIX A

LOW GERM AND DAMAGED SEED STOCK
(EXCEPT TAMALE AND BOLGATANGA)

| DESCRIPTION | QUANTITY | COST/KILO | TOTAL COST |
|------------------------------------|----------------|-----------|-------------------|
| TOMATO ROMA | 78½ KILOS | 729.38 | 57,256 |
| TOMATO TROPIC 1982 | 43½ KILOS | 729.38 | 31,728 |
| TOMATO INDIAN RIVER 1982 | 176½ KILOS | 729.38 | 128,736 |
| TOMATO | 20.34 lbs | 729.38 | 14,835 |
| POPCORN 1982 | 429½ KILOS | 389.00 | 167,075 |
| ONION - TEXAS GRAND | 167 KILOS | 782.95 | 130,752 |
| RADISH CRIMSON GIANT 1982 | 162 KILOS | 325.00 | 52,650 |
| WATERMELON - FAIRFAX | 112 KILOS | 389.00 | 43,568 |
| WATERMELON - CHARLESTON | 121 KILOS | 659.05 | 79,745 |
| WATERMELON - HULEBEST | 10 KILOS | 659.05 | 6,591 |
| CABBAGE COP MARKET 1982 | 21 KILOS | 560.25 | 11,765 |
| CABBAGE FKD | 15 KILOS | 560.25 | 8,964 |
| CUCUMBER | 18 KILOS | 389.00 | 7,002 |
| LETTUCE | 2 KILOS | 680.75 | 1,361 |
| SWEET PEPPER | 1½ KILOS | 1,820.00 | 2,730 |
| HOT PEPPER | 26 lbs | | - |
| CABBAGE STD | 70 KILOS | 560.25 | 39,217 |
| CABBAGE K K CROSS | 1 1/4 lbs | 5,835.04 | 3,326 |
| CAULIFLOWER | 4½ lbs | 1,760.00 | 3,608 |
| EGG PLANT B B | 32 lb | 578.56 | 8,418 |
| GARDEN EGGS (LOCAL) | 59 KILOS | | - |
| CARROT | 3.5 KILOS | 2,520.00 | 8,820 |
| OKRO | 225 KILOS | 750.00 | 80,798 |
| DWARK BEANS | 3 lbs | 495.70 | 674 |
| RICE SEED IR 42 | 66 MIN. BAGS | 36.138 | 108,414 |
| RICE SEED IR 42 | 2 lbs | 36.138 | 36 |
| SEED MAIZE (WEEVILED) | 65 MIN. BAGS | 2,500.00 | 162,500 |
| <u>CARRY FORWARD STOCK 1983/84</u> | | | <u>21,150,569</u> |
| LA POSTA MAIZE SEED | 4831 MIN. BAGS | 2,500.00 | 12,077,500 |
| | | | <u>13,238,069</u> |

APPENDIX B

APPENDIX B

FINANCIAL REPORT FOR THE MONTH OF JANUARY 1986

The month of January 1986 saw very austere measures being taken to ensure that cash outflow was restricted with a view to controlling expenditure. Financial activities during the month were not enough to keep the office running.

INCOME

The main source of income during the month was, as usual, revenue from sales generated from the Accra Sales Office. Total cash takings during the month (see Cash Flow) showed signs of an upward trend in sales as compared to sales for the month of December.

In order to increase our financial strength, vigorous efforts were made in pursuit of funds from the Ministry of Finance in respect of claims made. No success was achieved but there were hopeful assurances that funds would be released to the Company in accordance with the claims submitted.

EXPENDITURE

Bold attempts were made to control expenditure at all levels while some measures of success was achieved on most lines of expenditure. Vehicle running expenses in terms of fuel usage was the main problem area. Given below is the expenditure on fuel by vehicle.

| <u>Vehicle</u> | <u>Amount</u> | <u>Gallons</u> |
|----------------|---------------|----------------|
| GVA 7484 | 19,760 | 180 |
| GVA 7490 | 12,900 | 120 |
| GVA 8704 | 32,895 | 249 |
| GVA 7486 | 5,825 | 50 |
| GVA 8702 | 5,850 | 45 |
| GVA 8468 | 7,650 | 90 |
| GVA 6621 | 650 | 5 |
| GVA 7487 | 1,560 | 12 |
| GVB 181 | 11,750 | 111 |
| GVB 353 | 5,260 | 46 |
| GVB 183 | 9,750 | 75 |
| TOTAL | 113,850 | 983 |

It is strongly believed that if much more stringent controls are instituted, e.g., measuring kilometric run vis-a-vis gallons of fuel consumed, savings could be made. Waste in addition would be avoided as vehicles not performing up to standards could be tracked and the necessary maintenance effected.

SALARIES

The seriousness of the precarious liquidity position of the Company was felt by all categories of staff of the Company during the month of January 1986. Salaries could not be paid and even as of this date, they are still outstanding.

The new government salary structure is yet to be converted to conform to the salary structure of the Company due to the non-completion of the modalities for the conversion by the Accountant General's Department. The Accounts Department is making every effort to obtain the necessary guidelines for conversion as soon as it is available.

While it cannot be said with exactitude the net effect of the new salary structure on the Company's financial resources, it could be roughly estimated to be in the region of two and a half (250 percent) times of what was previously.

LIQUIDITY POSITION

Starting with an overdraft at the staggering figure of more than Ø50 million, the company's financial activities during the month were not improving the situation of further deterioration in its liquidity position.

Given below is a funds flow statement depicting the picture of the net effect of the Company's working capital.

CASH FLOW

-----Cedis-----

Sources of Funds

| | | |
|-------------------------|-----------------|--------------|
| Cash Sales | 1,364,017.00 | |
| Hire of Vehicles | 21,000.00 | |
| Sundry Refunds to chest | <u>8,042.40</u> | |
| Subtotal | | 1,393,059.40 |

Application of Funds

| | | |
|---------------------------------|------------------|---------------------|
| Traveling and Transport | 78,690.75 | |
| Vehicle Repairs | 16,400.00 | |
| Vehicle Running | 113,850.00 | |
| Seed Purchases (Hot Peppers) | 30,000.00 | |
| Staff Advances | 34,170.00 | |
| Equipment Repairs | 23,300.00 | |
| Printing and Stationery | 30,000.00 | |
| Accrued Expenses | 81,384.00 | |
| Batteries for Vehicles | 28,000.00 | |
| Estimated Interest on Overdraft | 700,000.00 | |
| Medical Expenses | 7,696.00 | |
| Hire of Equipment | 3,000.00 | |
| Salaries, Overtime, Etc. | 3,755.63 | |
| Conference Expenses | 21,255.00 | |
| Other Payments | <u>30,329.07</u> | |
| Subtotal | | <u>1,201,830.40</u> |

NET LIQUID FUNDS (Favorable) 191,229.00

RECOMMENDATIONS

There is a real need to open a dialogue with our bankers to consider the possibility of consolidating the overdraft into a loan account with very modest terms of repayments. A minimum period of two years should be our bargaining stand.

In due course, the quantitative advantages of the two methods of financing would be presented to aid management in a final decision making.

The rural sales program should be mounted immediately particularly within the Eastern Region and the Ashanti Region to take advantage of the early rains in those areas.

CONCLUSIONS

The hard times we are sailing through are not yet over and everyone is enjoined to be pragmatic in initiative and effort if we are to sail out of the stormy weather. Financial discipline is the key word, sacrifice is the wheel, and bold effect is the way to ultimate success.

GHANA MIDAS II SEED MULTIPLICATION PROJECT
PROJECT NO. AFR-0102-C-00-2003-00

END-OF-TOUR REPORT

William Hall
Seed Quality Control Specialist

February 1, 1982 to September 30, 1984

I. INTRODUCTION

A. MIDAS Project Background

The Managed Inputs and Delivery of Agricultural Services (MIDAS) I Project was authorized in 1976. It was designed to be the initial stage of a national program to develop and strengthen national and regional agricultural institutions to provide coordinated services and goods to small scale farmers.

The project consisted of six basic components:

1. Credit expansion
2. Fertilizer procurement
3. Seed multiplication, processing, and distribution
4. Small farm systems research
5. Extension-demonstrations
6. Marketing

As implementation of MIDAS I proceeded, it became apparent that the goals and objectives of the project were too complex for successful completion. The project was also initiated at a time of political unrest and economic decline in Ghana. There were four changes of government during the MIDAS I Project period.

The MIDAS I Project was amended 29th August, 1979, to instruct the contractor, among other things, to "collaborate with the staff of the Ministry of Agriculture and its Seed Multiplication Unit into the Ghana Seed Company (GSC), in:

1. expanding and improving the quality and quantity of foundation and certified seed;
2. contracting with private growers to produce certified seeds;
3. establishing a seed certification program;
4. processing and distributing seed; and
5. establishing a comprehensive seeds industry."

The MIDAS II Project was designed to concentrate efforts to a restricted area, the Brong-Ahafo region, except for the seed component, which would remain nationwide. It attempted to retain the six basic components. A fifth change of government occurred on December 31, 1981 just as the project was about to begin. Due to the continued decline of economic conditions, only the seed component was able to obtain the necessary inputs to show any progress.

A change of objectives developed in 1982 to modify certain basic components and to emphasize the progress of the Ghana Seed Company. The revised project purpose was to improve and expand the institutional capacity of the Ghana Seed Company, resulting in a viable, independent, profitable company.

B. Ghana Seed Company Background

The need for good seeds for use in Ghana's agriculture has long been recognized. This is reflected in the establishment of research organizations such as the Crops Research Institute, the University of Science and Technology at Kumasi, and the University of Ghana at Legon, and the inclusion of the Seed Multiplication Unit in the Department of Agriculture in 1961. After several years of study in the early 1970s, the decision was made to convert the Seed Multiplication Unit to a parastatal organization capable of operating as a private, incorporated seed company. Thus the Ghana Seed Company was formed in 1979, to be assisted by the MIDAS Project.

The Ghana Seed Company inherited the land, buildings, and assets of the Seed Multiplication Unit's foundation seed farms and area offices. Many of the Seed Multiplication Unit Staff were transferred to the Ghana Seed Company. At the start of MIDAS II, the Ghana Seed Company had its headquarters in Accra and area offices in Ho, Winneba, Kumasi, Tamale, and Bolgatanga. Each of the area offices had minimal seed quality control capabilities. Staff training and laboratory equipment and supplies were needed. The MIDAS II Project contained provisions for three technical advisers to serve with the Ghana Seed Company: a processing consultant, a production consultant and a quality control consultant. These were provided by Experience, Incorporated.

C. Assignment and Arrival of Quality Control Consultant

The Seed Testing and Certification Technologist joined the Experience Incorporated team on February 1, 1982 after a month's delay due to the change in Government of Ghana on December 31, 1981. He arrived in Ghana on February 9, 1982. The position is set forth in the MIDAS II Project paper signed June 16, 1980 under Technical Assistance Annex III-E.

The job description of the position calls for two functions:

1. Assisting the Officer-in-Charge of the Ghana Seed Inspection Service (GSIS) to:
 - a. establish a functional seed certification agency;
 - b. inspect fields and seed producing facilities;
 - c. test for quality and issue labels for seed meeting the seed laws and standards of Ghana.
2. Assisting the Quality Control Division of the Ghana Seed Company (GSC) in developing a system for monitoring quality of the seed product at each stage of production.

For a more detailed description of the assignment, the reader is referred to the plan of work prepared by the Seed Technology Consultant early in 1982 giving the then current status of the Ghana Seed Company and Ghana Seed Inspection Service with the goals, objectives, and steps to be taken to achieve those goals (See Appendix A).

The Consultant has worked closely with Mr. J. R. Turkson, Officer-in-Charge, Ghana Seed Inspection Unit (GSIU), Department of Agriculture and Mr. A. A. Amihere, Quality Control Manager for the Ghana Seed Company, in an effort to achieve these objectives.

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II. ACCOMPLISHMENTS

A. Program & Facility Development

1. Ghana Seed Company

When the Seed Technologist arrived, the Ghana Seed Company seed quality control laboratory was confined to a 9' x 15' cubbyhole. There was room for only one germinator and counter space only for a working table. Successful efforts accomplished the transfer of stored vegetable seeds from a large, 17' x 19' room, allowing the development of a more satisfactory laboratory. Two germinators were installed. Sample preparation and work tables were put in place. A table for moisture meters and microscope was available, as well as tables for an oven and torsion balance. A storage cabinet, 2' x 6' x 6', was constructed for sample storage. An adjacent room, slightly smaller, was developed as an air conditioned seed storage room for vegetable seed.

In accordance with the 1982 changes in the objectives of the MIDAS II Project and the Revised Implementation Plan, equipment and supplies procured for the Ghana Seed Inspection Service were transferred to the Ghana Seed Company. Following a three-week training course for Ghana Seed Company seed quality control personnel, the laboratory equipment and supplies were distributed for the seed laboratories at Ho, Winneba, Kumasi, Tamale, and Bolgatanga.

The training course from July 5-23, 1982 consisted of lectures and discussions on importance of seed to man and agriculture, development and maintenance of new varieties, and seed certification programs. Practical experience was gained in seed laboratory procedures with moisture determinations, purity analysis, and germination tests. Both standards and chemical (tetrazolium) germination tests were practiced. Quality Control Officers from Bolgatanga, Tamale, Kumasi, Winneba, and Ho participated in the course. The Quality Control Manager for the Company was attending the Mississippi State Seed Technology short course at that time.

During the sales period of 1982 (February-April), problems in tagging and seed lot identification were experienced. Tags were lost from bags during trucking to sales points, and large bags of seed were being divided into 10 and 20 pound sales lots without tags or labels. The importance of the tag and the necessity of seed lot identification in case of customer complaints of seed quality were stressed to the seed processing and sales personnel. The motto "a tag in every bag" was finally accepted. Heavy-duty staplers were purchased to secure tags

to the bags. "Make-your-own" rubber stamp kits were obtained to facilitate labelling the bags by eliminating the hand-written tag.

Prior to harvest in 1982, field inspection forms were developed (Figure II-1). Field trips were made to each of the areas, and field inspection training was given to quality control and seed production personnel. Methods of determining plant populations and percentage of diseased plants were explained and demonstrated. Field isolation by space and by time (plant maturity) was discussed and recorded on the report form. Field inspector training continued with supervision by the Consultant in the 1983 and 1984 growing seasons. Quality Control Personnel have been adequately trained to perform field inspection until the Ghana Seed Inspection Unit is established.

In the seed laboratories, technicians were instructed on how to determine screening losses, moisture content, seed purity, seed damage, 1000-kernel weight, and germination percentage of seed lots. A seed quality report form, as shown in Figure II-2, was developed with space for listing distribution. The total number of seed tests done in all laboratories increased from 1,582 in 1982 to 3,016 in 1983.

The required expendable supplies for all the laboratories for one year's operation were determined and submitted for purchase in March, 1983. Additional laboratory equipment to improve facilities and capabilities was also requisitioned.

Plans for a larger seed quality laboratory at the soon-to-be completed new Ghana Seed Company Headquarters building have been prepared. The design is for improved counter and drawer space for work areas and better storage for supplies.

2. Ghana Seed Inspection Unit

a. Development. In January, 1979, the Ghana Seed Company was formed by the removal of the Seed Multiplication Unit from the Department of Agriculture. As the Ghana Seed Inspection Service and National Seed Committee did not begin to function as a replacement for the Seed Multiplication Unit, a number of changes were required in Legislative Instrument (L.I.) 802 to meet this situation.

In October, 1982, in cooperation with Mr. Turkson, Officer-in-Charge, Ghana Seed Inspection Service, a proposed amendment to L.I. 802 was prepared. The original L.I. 802, entitled Seeds (Certification and Standards) Regulations 1973, legally established the National Seed Committee (N.S.C.), described its functions and set forth crop standards for corn, rice and groundnuts (peanuts). It took its authority from the Seeds Decree 1972 (NRCD 100), which established the Ghana Seed Inspection Service as the official seed certifying agency.

FIGURE II-1. GHANA SEED COMPANY LIMITED FIELD INSPECTION REPORT*

Area Office: _____

Grower: _____ Town/Village: _____

Variety: _____ Acres: _____

Number of Plots: _____

Complete the following for each plot:

Acreage covered by this report: _____ Plot #: _____

Check if Reinspection ☒

Is Isolation Satisfactory: _____

Explain Isolation Problem: _____

Previous Crop: _____

Stage of Maturity: _____

General Appearance: _____

Weeds (Kind and Amount): _____

Special Problems and/or Remarks: _____

Field Classification (circle):

Passed

Passed Conditionally

Rejected

Corrections Required or Reasons for Rejection? _____

Will this Field be Reinspected? _____ When? _____

Date: _____ Inspector: _____

Address of Inspector: _____

* Prepare in Quadruplicate: Give one to Grower

Send one to Headquarters, Accra

One for Area Manager's File

One for Grower's File

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The amended L.I. 802 with the reconstituted National Seed Committee was submitted for approval to the Attorney General's office in December, 1982. During discussions with the Attorney General and the Principal Secretary for Agriculture, it was decided to change the name from Ghana Seed Inspection Service to Ghana Seed Inspection Unit to conform with the Government of Ghana's structuring of agencies. In spite of continued efforts to get approval of L.I. 802 as amended 1983 from the Attorney General, it was not returned until September 1983. It was then forwarded to the Government of Ghana for the signature of the Chairman of the P.N.D.C. As of July 31, 1984, there had been no response to action on the Ghana Seed Inspection Unit.

b. National Seed Committee. Following the Fifth Maize and Cowpea Workshop in Kumasi on February 3, 1984, a group of maize, cowpea, rice and legume breeders as well as research administrators and representatives of the Ghana Seed Company met in recognition of the need for a national seed law. As they were aware of the existence, albeit non-functioning, of the N.S.C., they decided to identify themselves as the "ad hoc" National Seed Committee. They favorably accepted Mr. Turkson's report on the actions that had been taken to legalize the Ghana Seed Inspection Unit and urged further steps be taken. They expressed support of the plans and arranged for further meetings to discuss naming and release of new varieties; these actions were appropriate to the National Seed Committee.

A paper was prepared for meeting of the ad hoc National Seed Committee on May 28, 1984, setting forth requirements and procedures for the release of new varieties to the seed multiplication program of Ghana. This was used as a basis for discussions for release and naming of new varieties. Recognizing they had no legal authority at this time, they encouraged the continued efforts to establish the Ghana Seed Inspection Unit and requested a paper showing the structure and function of the Ghana Seed Inspection Unit on which they would express support to the Ministry of Agriculture. This is being prepared by the Quality Control Consultant and Mr. Turkson for the next meeting.

In consultation with Mr. Turkson, the requirements of laboratory equipment and supplies for the Ghana Seed Inspection Unit are being prepared. The distribution of equipment previously ordered for the Ghana Seed Inspection Service to the Ghana Seed Company laboratories necessitates another order. The function and coordination of the Ghana Seed Company and the Ghana Seed Inspection Unit laboratories will have to be established in defining the structure of the Ghana Seed Inspection Unit.

A complete listing of all special reports and papers prepared by the Consultant can be found in Appendix B.

B. Training

1. Trainee Participants

During MIDAS I, 16 trainee participants received 100 person-months of training. Lack of foreign exchange for airline tickets prevented Ghana Seed Company personnel from attending the 1981 and 1983 Seed Technology short course at Mississippi State.

In 1982, the Ghana Seed Company purchased a ticket for Mr. Amihere to attend the short course. In 1984, a change in policy allowed USAID to provide transportation as well as funding for participants, and three Ghana Seed Company trainees were sent to Mississippi State. These were Mr. Hammond, processing manager; Mr. Zinge, quality control officer at Bolgatanga; and Mr. Ocloo, area manager at Ho.

2. In-Country Training

In July, 1982, a seed technology training session was conducted by the consultant at the Ghana Seed Company Headquarters seed laboratory for five Seed Quality Control Personnel of the Ghana Seed Company, representing all laboratories of the Company.

Discussions covered:

1. The importance of seed to man and agriculture;
2. Varietal development and maintenance;
3. The purpose of seed certification programs;
4. Field inspection techniques; and
5. Laboratory procedures.

Participants gained practical experience in seed lot analysis, tetrazolium and regular germination tests, and field inspection techniques.

In September, 1982, Mr. Turkson and his assistant Mr. Amarteifo were given one month of seed technology training at the Ghana Seed Company Headquarters laboratory. The course followed much the same subjects as given earlier to the Ghana Seed Company Personnel, but discussions also included the updating and amendments for the Ghana Seed Decree of 1973.

A seed production and quality workshop was conducted by Officers of the Ghana Seed Company for Production and Quality Control Personnel in July 1983. The Production and Seed Technology Consultants assisted in this seven-day session in Navrongo. About 25 persons were in attendance.

Topics included:

1. Formation, development and maturation of seed;
2. Plant breeding and varietal development;
3. Certified seed production and management practices;
4. Seed sampling, germination tests, and record keeping in the seed laboratory;
5. The role of quality control in the seed business;
6. Laboratory procedures for moisture content determinations, seedling vigor and purity analysis; and
7. Seed processing and warehousing.

C. Quality Control Activities

1. Laboratory Exercises

The quality control program of the Ghana Seed Company has progressed very well. The laboratory personnel have learned quality control procedures and gained confidence in their testing ability. The number of laboratory tests increased from 1,500 tests in 1982 to 3,000 in 1983.

The Steinlite moisture meter did not have moisture content conversion charts for garden eggs (egg plant) or okra. These were constructed by correlating meter readings with moisture content determined by the air-oven method. This also served as a good training exercise for the laboratory technician and Quality Control Manager, as all electrical moisture meters should be tested and calibrated with the official air-oven method.

Close monitoring of imported vegetable seed sold by the Company is required. The policy of testing a can for germination of each variety every six months was established. Reports on inventory and status of seed lots are prepared on a semi-annual basis. Seed lots which were found going out of condition were sometimes blended with other lots from another company of the same variety with higher germination to salvage the seed by having the required viability to permit sale. Quality control officers and sales personnel were notified to take this action and instructed in blending techniques. Poor quality seed was removed from the sales stores.

2. Research Papers

a. Seedling vigor. The shortage of seed in the spring of 1983 caused the Ghana Seed Company to salvage seed losses by re-processing seed lots with a smaller bottom screen, thus saving more small seed. This led to the question of germination and seedling vigor of small seed. An 80-pot experiment was designed and conducted to compare size of seeds with the ability of seedlings to emerge from different depths, time of emergence

SPECIAL REPORTS & PAPERS PREPARED

The following papers were prepared by the consultant during

and top growth production. The quality and vigor of the smaller seed was found to be satisfactory. This experiment was written as a research paper and presented by Mr. Amihere at the Maize and Cowpea Workshop in Kumasi in 1984.

b. Seed Storage. It was been the practice of the Ghana Seed Company to double-bag maize in solidpoly and a polymesh bag for insect and moisture content control. With improved insecticides, it was desired to know if double bagging was necessary or if a single burlap or polymesh bag was sufficient. A seed storage experiment was designed and conducted with Dr. Ocran, Ghana Seed Company Research Manager, to sample seed lots stored in jute, polymesh and solidpoly bags each month for a six-month period. The seed lots were also divided into chemically treated lots using Actellic and Fernasan 'D' with an untreated check. Moisture content, insect damage, and number of insects were determined at each sampling from two locations, Winneba and Accra. The Accra lots were stored in an air-conditioned room, the Winneba lots in a non-conditioned warehouse.

Moisture content was found to increase in jute and polymesh bags at both locations. Moisture content increased to over 13 percent in these bags and was associated with loss of germination. Seed in solidpoly bags maintained their original moisture content and did not suffer loss of viability. Fernasan 'D' and Actellic chemical treatments were effective against insect invasion and were necessary even in the solidpoly stored lots. A scientific paper of this experiment was prepared and presented at the Maize and Cowpea Workshop in Kumasi in 1984 by Dr. Ocran.

3. Promotional Activities

Sales Inauguration Days were held annually in a different area each year. Grower meetings in different areas were also held prior to harvest. The seed consultant was requested to talk at these meetings on seed quality, its importance, and the maintenance of quality in seed production. Farm visits and field inspections also afforded the opportunity to increase farmer awareness of seed quality.

As a result of the severe food and seed shortage in 1983, many relief agencies sent or imported food grains to Ghana for 1984; some of this grain was used for seed. This cut sharply into Ghana Seed Company seed sales, as high seed prices caused farmers to purchase seed from the market. The poor stands in fields from this and other imported seeds caused concern in the Ministry of Agriculture for the quality of seed that was being distributed. This was used to emphasize the need for the Ghana Seed Inspection Unit, as Mr. Turkson and the consultant sought out imported seed lots for quality testing.

III. CONSTRAINTS

The biggest disappointment was the failure to legalize and implement the Ghana Seed Inspection Unit. It must, however, be viewed in the context of the political unrest and economic decline that the nation was experiencing. Many other matters occupied those responsible for organizing the Government. None of them were assured of their position for any length of time. The Secretary for Agriculture, Professor Bortei-Doku, was transferred in April, 1983, just as he became aware of the efforts to revive the National Seed Committee. A series of secretaries pro-tem occurred until March, 1984, when the current secretary, Mr. John Ndebugre, was appointed. The Director of the Department of Agriculture, Mr. Ako-Nai, was removed, and the Department is still under the Deputy Director, Mr. Pappafoi.

The failure to establish the Ghana Seed Inspection Unit prevented the development of seed and field regulations and a seed certification manual which would have required the concurrence and approval of the National Seed Committee. This also was a disappointment; however, drafts and preliminary papers have been prepared.

Only four of thirteen proposed trainee participants have been or are being given the training courses provided for in the Project Amendment No. 1. These have all been from the Ghana Seed Company with no training provided for future Ghana Seed Inspection Unit technicians. This will handicap the implementation of the seed certifying agency.

The lack of response by the Government of Ghana to the proposed establishment of the Ghana Seed Inspection Unit has already been discussed. It is regrettable that there was no additional staff provided nor laboratory facilities located. Lack of Government of Ghana support deprived the project of necessary inputs of transportation, local supplies, and equipment. The MIDAS executive committee refused to maintain the project vehicle or provide fuel when the Ghana Seed Inspection Unit was not made functional. The economic decline further reduced the opportunities to establish the Unit.

The economic condition and lack of foreign exchange with which to purchase airline tickets prevented the sending of participant trainees in 1981 and 1983. Political difficulties were also encountered as project funds were temporarily halted by USAID in April 1983. The decision of USAID to assist in the training program by allowing purchase of airline tickets from PL480 funds was negated by the withholding of funds in 1983, so no trainees were sent to the Mississippi State Seed Technology short course. The "freeze" also prevented the procurement of

needed laboratory supplies and additional laboratory equipment. The seed laboratories are operating with insufficient supplies, as purchase orders prepared in March, 1983 have not yet been received. Emergency purchases, allowed following the last Project Evaluation, has permitted continued functioning of the laboratories.

Communications between the Ghana Seed Company Headquarters in Accra and the Area Offices were very difficult. Messages were usually transmitted by Company truck drivers or personnel travelling to the area. Reports were often delayed one or two months. The planned radio network was not established.

IV. RECOMMENDATIONS

Continued training of laboratory technicians for the Ghana Seed Company is essential. Many of those previously trained in seed technology are now in administrative positions and not being used in the laboratories. The training should be at two or three levels: in-service training sessions, short course appreciation conferences, and long-term technical training programs. The Ghana Seed Company Quality Control Manager has attended the Mississippi State Seed Technology short course and should be encouraged to have training sessions for his quality control personnel.

Previously trained personnel should be utilized in the in-service training, as was done at Navrongo in 1983. Persons showing interest and initiative in the seed quality program should be selected for attendance in short course appreciation courses sponsored by FAO and other organizations on a geographical regional basis. Continued development of the seed quality program will require additional technically trained leadership. There should be at least two seed analysts at each of the Company laboratories. These should also be used as field inspectors during the growing season and monitors of the contract growers' harvesting procedures. Adequate personnel should be available to allow leaves of absence for training and short course purposes. Plans should call for both graduate level trainees and three to six month technical short course trainees.

As the Ghana Seed Inspection Unit is developed, plans must be made for the training and rotation (replacement) of personnel during training periods. Some training may have to be on-the-job (due to shortage of personnel), using a consultant to guide the program during the formation period. Initially, there should be three seed analysts at the Central Seed Laboratory in addition to the Officer-in-Charge and his assistant. They will also be used as field inspectors during the growing season. Additional staff will be required if Area Offices are established at Ho, Kumasi, and Tamale. The need for as many as fifteen trained seed technologists should be anticipated in a three year period.

The Project Evaluation team report in 1984 states: "The Ghana Seed Inspection Service, as originally envisioned, never developed. The need continues to exist, however, for the establishment of the Ghana Seed Inspection Service. Renewed efforts by Government of Ghana (meeting in Kumasi 1/) indicate that interest in forming the Ghana Seed Inspection Service may be revived. If this does in fact occur, the USAID could resume

1/ This refers to the first meeting of the ad hoc National Seed Committee.

support for this agency". If the Ghana Seed Inspection Unit is activated, this will require development and publication of Rules and Standards for seed certification. These should be made to conform with rules of other seed certification agencies and the O.E.C.D. to facilitate international seed trade.

V. ACKNOWLEDGEMENTS

The cooperation received from the Ghana Seed company Personnel during this tour of duty is gratefully acknowledged. The officers were:

| | |
|-----------------------|------------------------------|
| Mr. J. Wobil | Managing Director |
| Mr. E. Blay | General Manager |
| Mr. P. M. T. Kitcher | Ag. Administrative Manager |
| Mr. P. K. Poku | Production Manager |
| Mr. F. Hammond | Processing Manager |
| Dr. V. K. Ocran | Research Manager |
| Mr. A. Amihere | Quality Control Manager |
| Mr. O. Gyamera-Amoako | Sales & Distribution Manager |
| Mr. J. Erzuah-Nyenzah | Chief Accountant |

Area managers and quality control officers in the areas have been cooperative and pleasant to work with. Miss Becky Adotey, who served as secretary as well as performing laboratory technical duties, deserves special recognition.

The cooperation and assistance of Mr. Turkson and Mr. Amarteifoi in the Department of Agriculture are recognized and greatly appreciated. Mr. Ako-Nai and Mr. Pappafoi have served as Director and Deputy Director of the Department during this time.

Association with the USAID personnel of the project has been enjoyable, and their support and encouragement have been most useful. There have been three Mission Directors: Mr. Zarr, Mr. Sainers and Mr. Wagner. Program Officers have been: Mr. Mertens, Mr. Szadek, Mr. Flynn and Mr. Luche. Executive Officers Mr. Dietz and Mr. Parsons have provided very suitable living conditions which aided in maintaining morale.

The team members of Experience, Incorporated on the project have worked together in a most amiable fashion. Team leader Mr. Shulstad provided leadership and coordination with Experience, Incorporated headquarters. The cooperation and encouragement of Production Consultant Mr. Sandager throughout the tour and now the efforts of Agro-Mechanic Mr. Johnson to keep vehicles in shape have been most welcome.

The backup and administrative help of the Experience, Incorporated headquarters staff is also recognized and appreciated. Project visits by Mr. Eriksmoen and Mr. Holt provided encouragement and morale benefits to the team. Procurement Officer Mr. Locke has been very helpful.

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APPENDIX A

I. GOALS AND OBJECTIVES OF THE QUALITY
CONTROL TECHNOLOGIST

- o Development of quality control facilities and staff to assure production and distribution of high quality seed of superior varieties to Ghanaian farmers, thus contributing to increase of agricultural production.
- o To coordinate the efforts of the Ghana Seed Inspection Service and the Ghana Seed Company in the development of a viable seed program/industry containing the elements of varietal developments, seed multiplication and processing, quality control, seed marketing and distribution, and increased agricultural production through improved seed and cultural practices.

II. ACTIONS NECESSARY TO ACHIEVE THESE GOALS

1. Determine requirements for equipment and staff in area offices for the Ghana Seed Inspection Service and the Ghana Seed Company

The Ghana Seed Company presently has limited seed testing capability at its four area offices and headquarters facilities. Laboratory space at headquarters and Winneba is inadequate. Plans are underway to correct this deficiency.

Lack of electrical power at Tamale and Bolgatanga has caused problems in making germination tests of vegetable seeds. Alternating temperatures, required for most vegetable seed testing, have not been available.

The present quality control staff consists of the Quality Control Manager at the headquarter offices in Accra, and one or two persons in each office. At Winneba, the quality control officer also has salesmanship responsibilities and banking duties to perform. Efforts will be made through instruction seminars to improve the knowledge of the quality control staff.

In 1981, the Quality Control Manager made visits to all area offices to train personnel in laboratory techniques. The Seed Processing Consultant had assisted in outlining procedures and quality standards to be used. Instructions for sampling and seed testing practices were posted in each laboratory. The Consultant will continue visiting and monitoring the actions in area laboratories.

Much equipment for the laboratories is lacking. Purity analysis and germination tests can be conducted, but weed and other crop seed identity samples, hand screens, laboratory cleaners, magnifying glasses, and counting boards have not been obtained.

As stated earlier, only three persons have been assigned to the Ghana Seed Inspection Service. The legalization of the service through a Parliamentary Enactment Act was interrupted by the change in government organization. It is expected to be completed in the near future.

With the completion of the legalization process, the procurement of an office and central laboratory building should be possible. The organization of the Service will then proceed.

Present proposals call for the establishment of the central laboratory in Accra and branch laboratories in Kumasi, Tamale, and Ho, for a total of four laboratories. Equipment and supplies for these laboratories were ordered and have been received by the Seed Processing Consultant.

2. Develop the required amendments to the Seed Regulations of the Ghana Seeds Decree of 1972 for quality standards for field and seed inspections of certified seed

Basic work in this area has been done by the Seed Processing Consultant during the latter years of MIDAS I. Seed certification was provided for legally by the Ghana Seeds Decree, 1972, with Seed Certification and Standards Regulations enacted in January, 1973.

With the formation of the Ghana Seed Company in 1979, it was expected amendments to these Regulations would be made, changing the functions of seed certification to the Ghana Seed Inspection Service.

Certain amendments are also necessary to bring the seed program into conformity with programs of other nations. It is essential to use similar terms and standards so as to be able to enter international trade with a minimum of effort. The minimum standards and definitions used by the International Seed Testing Association (ISTA) should be incorporated in the Ghana Seed Program. The purpose of ISTA is to provide uniformity in techniques and procedures which will give accurate, replicable data indicating the quality of the seed. Seed moving within the country or in international trade may be tested by different laboratories. It is important, therefore, that all laboratories use standard methods designed to give universally the same results within an acceptable range. Training seminars will be held to assure that all seed technologists are using approved testing methods.

Varietal purity is an important aspect to a successful seed program. Regression in yield by contamination of high yielding varieties by inferior and common varieties can occur. Field inspections for variety purity can be made only if the inspectors know the varietal characteristics of the desired variety. The plant breeder or originating institution of the variety must provide a varietal description of all varieties entered in the seed program. Coordination between the Crop Research Institute and the Ghana Seed Inspection Service will be effected to provide this information. Field inspectors and seed analysts must also be able to recognize disease and weed contaminants. Collections will be made of disease symptom seeds. A herbarium of weed plants and seeds will be made.

3. Training of Ghana Seed Inspection Service and Ghana Seed Company Staffs in Seed Technology

The personnel of the Ghana Seed Inspection Service and the Ghana Seed Company quality control section must be trained in procedures and interpretation of data to assure the multiplication and maintenance of high quality seed. Preliminary training in field and laboratory procedures should be only the first step. Individuals showing interest and aptitude will be selected for additional training. General familiarity with seed production, processing, certification, storage, and marketing can suffice for broad operations of the seed program, but continued improvement and upgrading of the program require technicians who have complete understanding of the principles and technology involved.

Close collaboration between the consultant and his counterpart in the Ghana Seed Inspection Service and Ghana Seed Company will be aimed at providing capable leadership in the organizations upon completion of the consultant's contract. Program development and administrative decisions must be accomplished in consultation with the local personnel. Their involvement in these matters will provide them with experiences and background information to allow a continuation of the program.

All personnel need training at some time. The responsibilities of the job and personal characteristics of each person will determine the most appropriate kind of training. Training should be considered broadly in two categories, academic and non-academic training. Long-time programs should consider academic training for a few specialists and leaders. Not all phases of a seed industry require such specially academic training. Short courses, seed appreciation courses, seminars, and travel studies of successful operations in other countries can be used to develop skills of staff members and upgrade performances.

Table 1 shows the training program and number of trainees proposed for the quality control programs of Ghana Seed Inspection Service and Ghana Seed Company. The Ghana Seed Company is fortunate to have several trainees who have returned from participant training programs.

Table 1. PARTICIPANT TRAINEES REQUIRED FOR THE QUALITY CONTROL PROGRAMS OF GHANA SEED INSPECTION SERVICE AND GHANA SEED COMPANY DURING MIDAS II PROJECT

| | Ghana Seed Inspection Service | | | Ghana Seed Company | | | TOTAL |
|--------------------------------------|----------------------------------|------|------|-----------------------|------|------|-------|
| | 1982 | 1983 | 1984 | 1982 | 1983 | 1984 | |
| Academic Long Term Training | | 1 | 1 | | | 1 | 3 |
| Non-Academic Short Courses <u>a/</u> | 2 | 2 | 2 | 1 | 2 | 2 | 11 |
| Appreciation Courses <u>b/</u> | | 3 | 3 | | 2 | 2 | 10 |
| Travel Studies <u>c/</u> | | 2 | 2 | | 3 | 3 | 10 |
| Incountry Training | 2 | 3 | 3 | 5 | 10 | 10 | 33 |

a/ Mississippi State University conducts a 3-month short course on Seed Technology annually.

b/ Seed Technology short courses for 3- to 6-week periods are available through F.A.O. or M.S.U. programs in nearby countries.

c/ Organized tours to successful seed programs in other developing countries.

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4. Supervise Seed Certification Procedures

Supervision, training and counseling in seed field inspections, laboratory analysis, and record-keeping bring together the requisites for a complete program. The Seed Processing Consultant has drafted manuals for Field Inspection, Seed Inspection, and Seed Certification. With the assistance of the Ghana Seed Inspection Service and Ghana Seed Company personnel, these manuals will be completed and published.

Quality control has no beginning or end. The foundation seed purchased for multiplication must have had quality control measures applied to it the previous year, from time of planting through harvest and processing, just as it must now be subjected to field inspections and seed analysis to qualify for certified seed. Each person in the progressive steps of seed

production must be aware of the quality requirements of his operation and be knowledgeable of the entire certification procedure. Training sessions for field inspectors, together with growers and production advisers, will be held to stress the need for varietal purity isolation and care of handling seed at harvest time.

Processing personnel will be trained with laboratory technicians on quality measures required in the conditioning and processing of seed. Certification procedures and philosophies of superior seed will be covered at grower's meetings to assist growers in certified seed production and present means of enhancing the sale of their product.

A record-keeping system will be established to assure adequate seed lot identification from harvest through processing, storage, and marketing to subsequent seeding in the field. If quality problems arise, the seed and its progression through the certification process must be traced to identify the source and cause of the problem.

The tag printing process for labelling the seed, identification, and recording quality will be improved. The increased volume of seed and number of growers precludes the continued practice of hand writing the tags.

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APPENDIX B

SPECIAL REPORTS & PAPERS PREPARED

The following papers were prepared by the consultant during his tour of duty in Ghana:

1. Plan of Work (1982)
2. Proposed Amendments to Legislative Instrument 802 Seeds (Certification and Standards) Regulations, 1973 (1982)
3. Lecture Series for Seed Technology Training Session (1982)
 - a. Importance of seed to man and agriculture
 - b. Varietal development and improvement
 - c. Purpose of seed certification programs
 - d. Field inspection techniques
 - e. Seed laboratory procedures
4. First Annual Technical Reports, MIDAS II Project Quality Control Section (1982)
5. Lecture Series for In-Service-Training Workshop for Ghana Seed Company, Production, Processing, and Quality Control Personnel (1983)
 - a. The role of quality control in the seed business
 - b. Purity analysis procedures
 - c. Seedling vigor and moisture content determinations
6. Second Annual Technical Report, MIDAS II Project Quality Control Section (1983)
7. Co-authored, The Effect of Seed Size upon Maize Seedling Vigor (1984)
8. Co-authored, Seed Storage of Maize (1984)
9. Terms of Reference for Eligibility Requirements for Release of New Varieties (1984)
10. Proposed Organization and Function of the Ghana Seed Inspection Unit (1984)
11. End of Tour Report (1984)

REPORT FOR THE GHANA SEED INSPECTION UNIT

Dr. William Hall
Seed Quality Consultant
January-February, 1986

A. Introduction

1. Seed Program in Agricultural Development

All grain is not seed. Seed grain is the carrier of the genetic potential for higher crop production. Seed of improved varieties can trigger changes and bring about agricultural production increases. The seed program can be the vehicle for bringing about improved production practices by seed growers and other farmers. The extension service can use it to promote advanced technology packages. Increased production, greater demand for inputs, improved distribution, and marketing techniques, all create opportunities for private investment and agricultural advancement.

The maintenance of seed of superior varieties is essential to agriculture. Plant breeders and research agencies go to great length to develop varieties with superior characteristics, e.g. disease resistance, adapted maturity dates, drought tolerance, all aimed at obtaining greater yields. Only the maintenance of good seed stocks will retain these characteristics and prevent the erosion of superiority with poor varietal germplasm.

Strict control of parental seed stock is required for hybrid maize and sorghum varieties. These high yielding varieties achieve their greater production by the combination of certain parental germplasm. Composite varieties, such as those used in Ghana, are derived by combining superior, adapted lines to produce stable, yield efficient production. The contamination of these breeding materials of the seed produced by them by foreign pollen of inferior varieties reduces their potential high yield.

Most successful programs in Africa have developed from small beginnings. The development stages must occur in a well planned and logical sequence. Douglas, in his text "Successful Seed Programs: A Planning and Management Guide", describes the typical seed program development in four stages:

1. A plant breeding department multiplying small quantities of seed and distributing it to a few farmers.
2. Seed is multiplied by a plant breeding department, distributed to selected seed growers who multiply and sell it.

3. A national policy for development of a seed program including seed production, quality control, certification, marketing, and distribution.
4. Re-examination of national policy with attention given to developing and strengthening commercial seed production and marketing, promulgating a seed law, and establishing links with many related institutions and groups and conducting training.

Ghana is attempting to move from the second to the third stage.

The development of the Ghana Seed Inspection Unit (GSIU) should not be on a large scale. The primary objective of the GSIU should be to monitor seed that is sold to farmers to ensure its quality. If seed certification is not established at the outset to reduce the management cost of the unit, field inspections would not be required, as quality would be determined strictly on the seed samples. This is one scenario that would enable GSIU to start small and grow as it gains expertise.

As the program grows, additional activities can be introduced. Provisions for an expanding organization are important, e.g., field inspection to ensure variety purity and freedom of disease on the plants, expansion to other crops and eventually to plant materials. However, these are ideas for future development. I would not recommend a large and ambitious organization at the outset.

The operational mode of the quality control agency will depend upon the desired size of the program, the proven acceptance of seed certification by farmers and the enthusiasm and dedication of the staff.

A national seed program consists of several elements including:

- o Plant breeding and varietal development
- o Seed multiplication - certification
- o Seed legislation and quality control
- o Import/export and marketing laws
- o Extension/education and information on seed

The development of each element may be independent from the other, but in a well planned program they will be balanced and coordinated.

2. Ghana's Current Position

Ghana's seed program has a long history. The importance of a regulated seed program was apparently recognized at the time the country gained its independence. The Hybrid Maize Seed Production Unit (HMSPU) was included in the organization of the Ministry of Agriculture. The Prevention and Control of Pests and Diseases of Plants Act (Act 307) was passed in 1965. The HMSPU gave way to the Improved Seed Multiplication Unit and later the Seed Multiplication Unit, both of which focused attention on development of composite seed varieties.

The Ghana Seeds (Certification and Standards) Decree was issued in 1972. It provided, among other things, that the Minister could by legislative instrument make regulations establishing a National Seed Committee and a Ghana Seed Inspection Service as the official seed certification agency. This was accomplished by L.I. 802 (1973).

As mentioned earlier, not all aspects of a seed program need be developed simultaneously. In Ghana, the varietal development segment is well established in the Crop Research Institute where adapted rice varieties and suitable composite maize varieties are being developed for improved agriculture development. Cowpeas, sorghum, and groundnut varieties are also being evaluated. The Seed Multiplication Unit provided the seed supply for distribution to growers. It was expanded in 1978, removed from the Ministry of Agriculture and became the Ghana Seed Company. This provides for the seed multiplication factor.

The withdrawal of the SMU from the Ministry of Agriculture required amendments to L.I. 802. These were made and approved as Seed (Certification and Standards) Regulations, 1983, L.I. 802 Amended. Thus, in accordance with previous enactments the legislative portion of the seed program continues.

The object of this report is to outline and propose the organization and procedures for the Quality Control Agency.

B. Recommendations

1. Basic Assumptions and Scope of Work

The primary function of a governmental seed quality control agency is to ensure the quality of seed to its farmers. This can be done in a number of different ways, e.g., with strict regulations requiring the multiplication of basic seed developed in research institutes by other governmental agencies, or by pre-market control where every variety must be officially approved and standards met before seed can be offered for sale.

At the other extreme, legislation may require only that seed be labeled with certain information that is truthful. The buyer chooses the variety and quality he desires.

The option recommended for Ghana lies between these extremes. The implementation of the Ghana Seed Inspection Unit will provide the pre-marketing quality control to ensure distribution of good seed. GSIU will sample seed at the market price for analysis in the laboratory to insure it is properly labeled. Initially it would not be necessary to inspect fields which is a part of the seed certification program.

Seed certification is one tool for producing genetically pure, good quality seed of improved varieties. Certification basically provides a pedigree of the seed from point of sale back to the plant breeder. Quality standards such as germination, purity and freedom from inert matter are usually made part of the standards required for certification.

Field inspections are required with seed certification to ensure varietal purity. It is difficult to distinguish many varieties by seed characteristics. Field inspections allow varietal identification by agronomic characteristics. Inspectors determine the trueness-to-type of the crop in the field. Trueness-to-type does not necessarily mean uniformity. Some varieties, especially composite maize varieties, have a bred-in variability which must be recognized. When releasing a variety the plant breeder must include in his description of the variety the amount of variability that can be expected.

Field inspections are also required to ensure the proper isolation of fields of cross-pollinated crops. Foreign pollen from adjacent non-certified fields can contaminate seed being produced for certification. Field inspections are not necessary until the National Seed Committee approves and publishes a list and descriptions of varieties for seed multiplication (certification).

In the initial stage, the GSIU should not attempt seed certification, but limit the scope of activities to collecting samples of seed and ensuring the quality of the seed conforms to that shown on the label.

2. Relations Between GSIU and the GSC and Its Contract Growers

The GSC can be viewed as a seed producer who makes application for certification to the National Seed Committee (NSC). Upon its acceptance by the NSC, the GSC becomes responsible for the quality of seed produced by its contract growers and offered for sale by the GSC. The Company Quality Control Division has the responsibility to see that proper field and seed standards

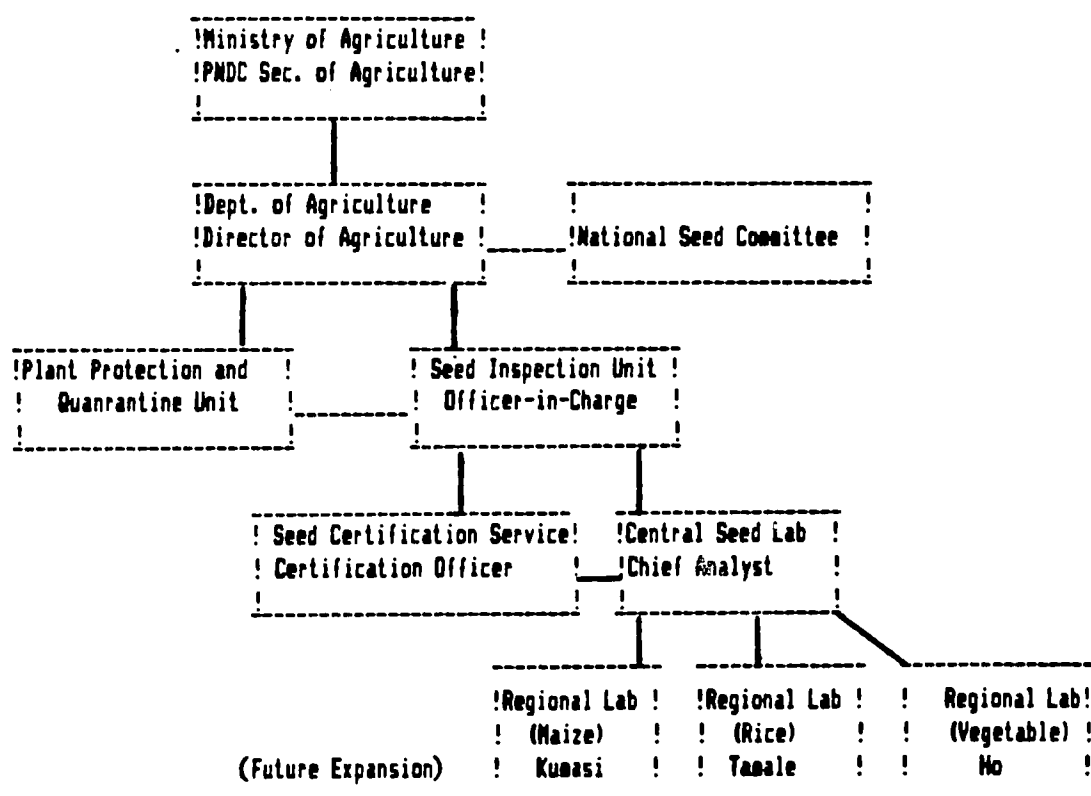
are met. The GSIU should expect to make unannounced spot inspections to assure itself that the GSC is making the proper field inspections and quality tests.

3. Proposed Organization of the GSIU

The Ghana Seed Inspection Unit is expected, at least initially, to function with the Department of Agriculture. It should be an impartial body with semi-autonomous status, free to act within the framework of acceptable approved procedures for seed certification and for seed testing.

The National Seed Committee was established and its functions described in L.I. 802, Seeds (certification and standards) Regulations, Amended 1983. It will serve as an advisory body of the GSIU on working procedures, rules and regulations, field and seed standards, fees and charges all subject to the approval of the PNDC Secretary for Agriculture. It is composed of high level representatives from various organizations involved in agriculture and can be of great assistance in obtaining the support of the Ministry of Agriculture and other Directorates and Agencies in the development of a seed program.

FIGURE 1. ORGANIZATIONAL CHART



Discussions with Mr. Korang Amoaka, officer-in-charge of the Plant Protection and Quarantine Unit (PP&QU) indicated the possibility of the GSIU sharing laboratory space with the PP&QU. These two units should be well coordinated and the proximity of the laboratories would not be disadvantageous. This would be superior to sharing seed laboratory space of the GSC. The laboratory is located near the village of Pokoasi, approximately 11 miles north of Accra on the Kumasi road.

A visit to the laboratory confirmed the adequacy of space. Additional office equipment, e.g., desks, chairs, tables, etc., would be required. Also improved electrical service would be needed; a three-phase step down transformer would be required to provide additional 220 volt power. The GSIU officer-in-charge should have his office here as well as the other two officers. Close liaison can be developed between this office and the Department of Agriculture to permit seed samples and applications for sampling to be delivered to DOA offices.

4. Development of Operational Procedures

The appointment of the officer-in-charge and his responsibilities is set forth in a letter from the Director of Agriculture dated December 19, 1979. His instructions were to:

- o Prepared budget estimates;
- o Have legislation prepared and passed to give legal backing to the GSIS;
- o Recruit the pioneer staff of the GSIS;
- o Secure buildings for the headquarters and regional offices of the GSIS; and
- o Obtain office equipment and furniture.

The instructions are still valid. The legislation has been accomplished. The following pioneer staff for headquarters and central laboratory development is suggested:

- o Officer-in-charge
- o Assistant Officer-in-charge (Chief Seed Analyst)
- o Assistant Officer-in-charge (Certification Officer)
- o Secretary-typist

Samples of seed offered for sale should be collected and analyzed for percent germination, other crop seeds, weed seed and inert matter. The Ghana Seed Company is currently using the minimum standards:

| | <u>Percent Germination</u> | <u>Percent Purity</u> |
|------------|--------------------------------|---------------------------|
| Maize | 85 | 97 |
| Rice | 80 | 92 |
| Sorghum | 75 | 90 |
| Groundnuts | 75 | |
| Cowpeas | 80 | 98 |

The minimum standards should be reviewed and approved by the National Seed Committee.

The Chief Seed Analyst and Certification Officer are expected to serve as "analyst-cum-inspectors" collecting seed samples and making field inspections during the seasonal needs, as well as performing seed laboratory duties, until the program requires more personnel. Recent production records of the Ghana Seed Company indicate required sampling and analysis of seed could be accomplished by two or three persons.

The Ghana Seed Company is currently using tags of two colors on their seed. White tags indicate Breeder or Foundation seed eligible for production of certified seed. Blue tags are placed on seed meeting minimum quality standards to be sold as certified seed. The tags report the kind of seed (crop), variety, lot number (which can be used to identify grower) and percent germination. This labeling is satisfactory until the certification program is implemented. The GSIU should determine that the germination of the seed equals or exceeds that stated on the label.

Until the time of certification the GSIU need not be concerned with the printing and issuing of tags. They are enforcing the truth in labeling requirement. With the advent of certification, the seed laboratory should assume the responsibility for printing the tags with the required quality information. Growers or seed companies will request that seed samples be taken after processing to be analyzed, and request the desired number of tags be issued to tag each bag in the seed lot, if the seed is acceptable. Color coded tags, white for breeder and foundation seed, purple for Registered seed and blue for Certified seed as specified in L.I. 802, should be used.

5. Implementation

The National Seed Committee should meet concurrently, or before, the establishment of the laboratory. Among their duties should be the approval of varieties to be included in the seed program and a request for the varietal descriptions from the plant breeders.

The GSIU officer-in-charge should review previous quality standards published in L.I. 802 (1973) and present to the NSC for approval the quality standards for maize, rice, cowpeas, sorghum, and groundnuts. The quality standards and list of approved varieties should be published as soon as possible.

The staff for the GSIU should be identified immediately. An officer-in-charge, chief analyst, and certification officer should be adequate staff at the outset. A number of candidates may be found among those who have benefited from previous seed technology training courses. The small pioneer staff outlined does not make provision for future training of personnel. On the job training will have to suffice until additional personnel are selected and sent for training.

Two vehicles should be provided the GSIU. This will allow use of one at the headquarters and laboratory while the other may be up-country collecting samples. A type similar to the Chevrolet Blazer is recommended.

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APPENDIX A

APPENDIX A

Seed Laboratory Equipment

Following is a list of the required basic items for the seed laboratory. Make and model numbers are for illustrative purposes. Detailed specifications should include, 220 and 50HZ on all electrical equipment.

| Require- ment | Item | Estimated Cost FOB United States |
|------------------|--|--|
| 1 | Seed Germinator, seedburo 6600 | \$ 3,500 |
| 1 | Oven, stainless steel, cenco 262 | 700 |
| 1 | Moisture meter, steinlite mdl 500 | 1,250 |
| 1 | Moisture meter, dole 400B, portable | 269 |
| 1 | Divider, Boerner sampler, #344 | 700 |
| 1 | Scales, Grain weight, seedburo 750-S | 110 |
| 1 | Balance, Torsion, 101 gram capacity, w/weights | 600 |
| 2 | Purity boards, seedburo mdl 135 | 280 |
| 2 | Dazor magnifier lamp, seedburo U1-N270 | 400 |
| 2 | Tripod magnifier 10xpower | 100 |
| 1 | Stero-microscope, seedburo 400, 15&30 x | 500 |
| 1 | Seed trier 1-3/8 x 102cm seedburo 39-04 | 134 |
| 2 | Seed trier 1/2" x 76cm seedburo 180 | 120 |
| 3 | Bag probe 1" x 30cm seedburo 79 | 84 |
| 1 | Hand grinder, seedburo 438 | 70 |
| 6 | Sample pans, triangular 10 x 10 x 2-1/2 | 62 |
| 6 | Sample pans, round 9-3/4 x 2-7/8 | 9 |
| 1 | Dessicator, 20cm diam w/plate | 75 |
| 1 | Counting boards, set of 3, Erikson | 450 |
| 1 | Hand screens, 9 x 9, set 12 w/rack | 250 |
| 24 | Aluminum sample cans | 25 |
| 24 | Seed containers, 1/2 gal. plastic | 40 |
| 60 | Petri dishes, 150 x 20 mm (5-1/2") | 105 |
| 1 | Laboratory scoop, cast aluminum | 5 |
| 2 | Graduate cylinder, 50 ml | 15 |
| 6 | Erlemeyer flask 250 ml | 20 |
| 12 | Beakers, 50 ml | 24 |
| 12 | Beakers, 400 ml | 48 |
| 6 | Forceps, fine point | 42 |
| 6 | Forceps, medium point | 30 |
| 6 | Hand Tallys | 90 |
| 6 | Thermometer, 0-220°C, tube type | 54 |

Seed Laboratory Equipment (continued)

| | | |
|----------|-----------------------------------|--------------|
| 1 | Humidity guage, Abbeon mdl R560 | 100 |
| 1 | Laboratory tongs | 5 |
| 1 | Numbering machine, 7 diget | 50 |
| 1 | Date stamp machine | 25 |
| 1 | Rubber stamp set, labelon | 25 |
| 2 | Stapler, heavy duty Ace 82 | 50 |
| 1 | Calculator, desk top | 25 |
| <u>1</u> | Tag printer, manual, steilow E010 | <u>1,500</u> |
| 40 | Estimated Cost of Equipment | \$11,941 |
| | Overseas shipment 35 percent | <u>4,179</u> |
| | TOTAL | \$16,120 |

Does not include office equipment:

| | |
|--------|-------------------|
| Desks | Typewriters |
| Chairs | File Cabinets |
| Tables | Photocopy machine |

APPENDIX B

APPENDIX B

Seed Laboratory Supplies

Following is a list of supplies for the seed laboratory for one year, not exceeding 2,000 samples. It is well to order sufficient supplies for the initial year with future orders to cover replacement of used supplies plus expected expended program.

| Require- ment | Item | Estimated Cost FOB United States |
|------------------|---|--|
| 2m | Germination paper, hvy. weight | 60 |
| 2m | Germination paper, reg. weight | 120 |
| 2m | Wax paper, 12 x 18" | 90 |
| 5m | Blotter circles, 5-1/2 diam | 50 |
| 26x | Razor blades, single edge | 6 |
| 3rls | Masking tape, 3/4" x 60 yards | 15 |
| 3rls | Cellophane Tape, 3/4" | 3 |
| 2bx | Rubber bands, 1,000/bx. | 12 |
| 2bx | Staples, Ace hvy. duty for clipper 82,1,000/bx. | 10 |
| 1bx | Microscope slides, plastic 50/bx. | 10 |
| 1dz | Pencil, china marking, red | 6 |
| 1dz | Pencil, indelible, black | 4 |
| 1btl | Stamp pad ink, black | 2 |
| 1pkg | Tetrazolium, 50 gram pkg. | 80 |
| 1cn | Insecticide, 1 lb./can | 5 |
| 1cn | Rat & mouse poison bait 5 lbs/cn | 10 |
| 2m | Laboratory cards | 50 |
| 1 | Laboratory log book | 5 |
| 2m | Envelopes, sample, 7 x 11-1/2 | 200 |
| <u>2m</u> | <u>Bags, polyethylene 6 x 13" 6 mil</u> | <u>1</u> |
| 20 | Estimated cost of supplies | \$395 |
| | Overseas shipment 35% | 138 |
| | TOTAL | <u>\$533</u> |

Does not include office supplies:

| | |
|------------------|------------------|
| Typing paper | Office envelopes |
| Mimeograph paper | Pens and pencils |

APPENDIX C

APPENDIX C

Using the previously listed equipment and supplies and current salary structure, the initial program cost would be as follow:

| | United States Dollars | Cedis Equivalent @ 090/\$ |
|--|-----------------------------|---------------------------------|
| Equipment | 11,941 | 1,074,690 |
| Supplies | 395 | 35,550 |
| Shipping Charges | 4,317 | 388,530 |
| Subtotal | <u>16,653</u> | <u>1,498,770</u> |
| Salary & Wages | | |
| Officer-in-charge (D.D. Ag.) | 1,531 | 137,800 |
| Chief Analyst (Sr. Ag. Officer) | 1,524 | 131,200 |
| Certification Officer (Sr. Ag. Officer) | 1,524 | 131,200 |
| Secretary-typist (Aid-1) | 648 | 58,320 |
| Subtotal | <u>5,227</u> | <u>1,957,290</u> |
| Subtotal | 21,880 | 1,957,290 |
| Vehicles 2 @ \$20,000 | <u>40,000</u> | <u>360,000</u> |
| GRAND TOTAL | 61,880 | 2,317,290 |

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GHANA MIDAS II SEED MULTIPLICATION PROJECT
PROJECT NO. AFR-0102-C-00-2003-00

END-OF-TOUR REPORT

Paul R. Mezynski
Seed Processing Specialist
August 7 - October 27, 1985

I. INTRODUCTION

The assignment for the short term consultancy was outlined in a letter written by Kenneth E. Holt, Project Administrator, Experience, Incorporated, dated June 24, 1985, and is as follows:

- o Assist in the start-up and operation of the newly installed seed processing plant at Winneba including receiving, shelling, drying, cleaning, bagging, and storage of seed.
- o Training of supervisors and operators of the Winneba plant, making them familiar with all of the functions and equipment in the plant.
- o Prepare procedural manuals with details needed to insure that the trainees can continue to operate the plant in an acceptable manner.
- o As time permits, visit and conduct training sessions at other seed processing plants operated by the Ghana Seed Company.

As usual, the assignment was very broad, continuous, and could take years to accomplish. On the other hand, the assignment allowed flexibility so that progress could be made in the most promising area. It was hoped that the major emphasis could be on teaching and training, but getting the plant operational took precedence. Considerable time and effort was expended in trouble shooting; correcting improper installation; and repairing and modifying equipment to make it operational. Working with the contractor was sometimes painfully slow, requiring close supervision to get tasks accomplished as required.

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II. TASKS ACCOMPLISHED

- A. Collected hand tools for Winneba Seed Processing Plant.
- B. Designed and contractor constructed work bench, tool cabinet, and a 6 x 18 x 24 inch cabinet for 30 plastic boxes for fasteners. Carpenters did a good job using old crating material. The purchase by Ghana Seed Company of ordinary items like nails, screws, hinges, hasps, locks, paint, and brushes was unbelievably complex and slow.
- C. Uncrated and/or made operational office tester, air and screen seed cleaner, drill press, arc welder, oxy-acetylene welder, hydraulic press, 10 inch grinder (not operable yet), and hygrothermograph. Some equipment has been in storage for four years and cannot be considered as new equipment. In some cases, it would take more than a full day to get one piece in working order. The Agro-mechanization and Seed Production Management Specialists contributed much in this effort.
- D. Designed and constructed two screen racks for seed screens for the 68D seed cleaner. Indexed and organized approximately 80 screens.
- E. Unloading mechanism in the bottom of the column drier was semi-functional (making diagnosis of the cause more difficult). It took several days to correct the problem with considerable help from Sheldon Sandager.
- F. The 27 Clipper cleaner was repositioned, modified, simplified, and correctly adjusted for more effective and efficient operation. Installation is still not acceptable with open air discharge inside the building.
- G. Numerous deficiencies with the basic air and screen seed cleaner 68D were corrected.
 - 1. Support leg for the holding bin above the 68D cleaner was faulty and had to be redesigned and constructed.
 - 2. Hopper tank was not properly assembled and it spilled maize with rain. Orris Shulstad fixed it by compressing the circular bottom with a chain.
 - 3. A handle with a universal joint for synchronized air control was missing. A new handle was constructed and fitted.
 - 4. Spouting for three of the discharge outlets had to be designed, constructed, and installed on the left side of the machine along with a bag holder.

5. Clean out door warped by weather was modified and made to fit nearly air tight as required.
 6. Three foot steel base for 68D was weak and vibrated. Sheldon Sandager and David Johnson cut and welded diagonals in the base of the stand for greatly improved stability.
 7. Vibrating conveyer for clean seed discharge was repaired and made leakproof by the Seed Processing Engineer.
- H. Wrote a 20 page operators manual and training guide for 68D, including parts, functions, adjustments, maintenance, and a questionnaire study guide.
- I. Provided instruction for the operation of equipment for maize receiving, shelling, conveying, aerating, drying, and storing, including operation of the control panel and sequence of operation and adjustment of control valves.
- J. Conducted walk-through inspection and maintenance procedure.
- K. Organized and conducted, with the help of the Seed Production Management Specialist and some GSC personnel, a three-day workshop.

III. CONSTRAINTS

Voltage fluctuation and power outages continue to be major problems, causing motors, transformers, voltage stabilizers, and magnetic switches to burn out and disrupt seed drying and processing schedules. This is a serious concern for a plant with a design capacity of 2,500 tons for the maize harvest season.

IV. RECOMMENDATIONS

A. Maintenance

The equipment supplied to Ghana Seed Company is of good quality and could last a lifetime if properly maintained. Availability and procurement of replacement parts are and will continue to be very serious problems; therefore, it is highly recommended that administration make a commitment to a regularly scheduled maintenance and repair program and see that it is properly carried out. A commitment means that a successful maintenance program needs to have precedence over all other activities, including production.

B. Seed Cleaner 68D

This is a basic piece of equipment in any seed conditioning facility. It will give years of good service if properly maintained.

1. The upper air "seed cleaning" is done by aspiration; therefore, it is a closed air system. The upper air discharge needs to be fitted with an air lock discharge gate for better control of air and air liftings.
2. Termites and rot have done considerable damage to the lower frame so that it is not securely fastened to the base and vibrates at high shaker speed. This needs to be replaced, repaired, or reinforced with iron to reduce vibration to zero.
3. Arrange elevator hopper to catch flat grade of maize (over #2 screen). Erect a holding bin to rear of 68D to collect flat grade for subsequent bagging.

C. Seed Cleaner Clipper 27

1. Rotate 180° so that air discharge faces the south wall. Cut rectangular opening in the wall. Construct galvanized sheet metal ducting from the 27 to the outside. Curve ducting downward on outside to prevent rain from coming in.

2. Erect a second elevator and cleaned seed holding bin for more efficient seed handling.
3. Increase size (holding capacity) of bins to hold at least one wagonload.
4. Receiving could be improved by excavating a pit for the elevator boot. Be certain to use waterproofing in the cement for the pit. Add extension to the elevator to compensate for the depth of the pit and the added height of the holding bin. Be certain to locate the short section with inspection part at eye level position so the seed level in the cups can be observed.
5. Assuming cowpeas are to be processed with the Clipper 27, a 11/64 x 3/4 and/or 12/64 x 3/4 bottom screen will be needed for this operation.

D. Pallets

In order to effectively and efficiently utilize the fork lift truck, proper sized pallets need to be constructed. There is no need to purchase a second fork lift truck if bags continue to be handled by hand. Two proper pallets using wood from existing pallets and scrap material from old crating have been constructed and are in use.

E. Receiving and Shelling Ear Corn

For an anticipated production of 2,500 tons, this area needs to be improved for more efficient off-loading, inspection, and shelling. Careful thought must be given to every step in this process. Perhaps a dump hopper needs to be considered for easier horizontal unloading.

F. Conveying, Storing, Drying System

This complex was designed for handling commercial corn which does not require clean up between varieties. The three drag conveyers can be a source for mixtures because they are not self-cleaning. 100 percent clean out might be as simple as wrapping a cloth around one or two cross links and letting it sweep the bottom of the conveyor. Small openings can be cut in the top so that the air blower can be inserted for cleaning. Inclined screw conveyers can be cleaned by removing the top plates and blowing or vacuuming the interior. Cleaning out the elevator boot is no special problem. Seed will lodge on the unloading gates from each silo. Cleaning with compressed air will do a good job.

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GHANA MIDAS SEED MULTIPLICATION PROJECT
Project No. AFR-0102-C-00-2003-00

End-of-Tour Report

Kenneth Haines
Extension/Demonstration Specialist
September 1, 1980 to August 31, 1982

I. INTRODUCTION

The Managed Inputs and Delivery of Agricultural Services (MIDAS) Extension/Demonstration Component was designed to improve the performance and effectiveness of the agricultural extension service by introducing new techniques and providing training to the field staff. The ultimate goal was to improve MIDAS' ability to deliver relevant information to small farmers on a timely basis. It was believed that this would help the farmers improve their production techniques and thereby improve their standard of living.

This program was to be initiated in the Atebubu District of the Brong-Ahafo Region of Ghana (where the specialist was to reside) and subsequently be expanded to cover the entire region of nine districts. The program began in September, 1980 as part of the MIDAS Project. The overall project was designed to reach 80 percent of a target group of small farmers (those with 10 acres or less of cultivated land) within 5 years providing improved production practices and delivery of increased agricultural services.

The program was also to introduce and utilize as many appropriately established agricultural extension techniques and methods as possible, and focus on establishing an on-farm demonstration program and in-depth training sessions. Utilization of publications, field days, and farmers' meetings were also to be stressed.

The specialist was able to work with and advise the Ministry of Agriculture (MOA), Department of Agriculture for most of two cropping seasons, ending in August, 1982.

As a result of the specialist's work, in cooperation with the MOA Department of Agriculture in the Brong-Ahafo Region, an extension/demonstration program was established. In the course of his work the specialist was able to motivate, train, and provide other incentives for the establishment of this program. Most of the extension staff with whom he worked responded favorably to both his efforts and the influx of relatively up-to-date and dynamic information.

For a number of reasons including availability of improved seed, tested production packages, and other important inputs, the program emphasized maize. Research data on improved maize production was available due to a cooperative effort between the MIDAS Extension Component and the Crops Research Institute/Grains Development Board (CRI/GDB) based at Kwadaso, Kumasi. It is hoped that this project will continue to function after the MIDAS Extension specialist has concluded his work. If efforts to continue the relationship are made by the regional officer, it is hoped CRI/GDB will act as an information and materials backstop for the extension staff.

A number of social and physical constraints have made the establishment of the program and its potential for continued success difficult. Some constraints are man-made (e.g., availability of fertilizers, changes in government policy and support, and budgeting); other natural constraints include rainfall patterns and soil fertility. If the human factors can be manipulated in such a way as to allow the agriculturalists to make their recommendations and follow through with appropriate examples and inputs, then a significant number of farmers will adopt at least some of the recommended practices, and thus increase domestic food production.

II. MIDAS EXTENSION/DEMONSTRATION COMPONENT

A. Introduction

The MIDAS Extension/Demonstration component was designed to demonstrate to the small farmers (those with 10 acres or less) in the Brong-Ahafo Region improved production practices and other techniques designed to increase their production and consequently their standards of living. It was also intended that these demonstrations would stress the use of inputs and services provided under MIDAS.

The specialist was to design a demonstration program and liaise with other MIDAS components and/or other national organizations for delivery of necessary inputs and services to the farmers. In addition, he was to simultaneously train and work with the administration and the field officers of the Department of Agriculture (Extension Service) in upgrading their ability to provide extension services to the target group and others.

B. Personnel

The mandate of the Department of Agriculture (under the auspices of the Ministry of Agriculture) includes the timely dissemination of appropriate materials, as well as offering advice to, and working with the farmers in whatever way possible to improve farm crop production. Other branches of the MOA are independently responsible for different areas including animal husbandry, and fisheries.

The Brong-Ahafo Region is made up of nine districts. Each district has an agricultural officer, who in most cases holds a diploma from one of the agricultural colleges or universities. In some instances district officers have university degrees.

Target personnel with whom the specialist was permitted to work consisted of the Department of Agriculture field and district officers from Brong-Ahafo Region. Altogether there are about 165 officers at this time. These officers are agents who spend their time out in the field working with the farmers on everyday production concerns.

The specialist's counterpart was the Regional Agriculture Officer (RAO), Mr. J.K. Tawiah, whose offices are in the regional capital of Sunyani. The specialist also had occasion to work with the Regional Agricultural Coordinator, Mr. B.K. Owusu, who is responsible for overall coordination of all MOA departments in the Brong-Ahafo Region.

The original project agreement called for focusing efforts on two districts per year and expanding accordingly. Since the specialist was located in Atebubu District, it was agreed that the program would initially begin there. Nkoranza District was chosen as the second target district due to its proximity to Atebubu.

The Atebubu District exemplifies typical district level staffing. Atebubu District has one District Officer, Mr. F.K. Atiemo, who as Production Officer (PO) served as the specialist's closest counterpart. The field staff consists of five Senior Technical Officers (STO's), four Technical Officers (TO's), three Third Year Learners, seven Senior Technical Assistants (STA's), and three Technical Assistants (TA's). In addition there is an office and support staff consisting of an executive officer (office manager), an accounts officer, a storekeeper, a typist, and a messenger. Each district usually employs a variety of male and female laborers.

C. MIDAS Extension/Demonstration Program

The actual field demonstrations are based on two assumptions:

1. If farmers are given a logical choice between several technologies, they will select the one that they feel will work best for them, and;
2. If farmers take an active part in all phases of the demonstration program, they will in effect learn by doing, and thus be able to make choices based on practical experience rather than observation alone.

With this in mind, it must be noted that, while four main crops were initially emphasized, only one (maize) has been demonstrated outside of Atebubu District. The other three include yellow maize, groundnuts, and cowpeas.

The demonstrations consist of both method and result demonstrations. The farmer is asked to prepare his land in the normal fashion. He is then requested to provide a one-quarter-acre parcel of that field for demonstration purposes. This land should be adjacent to a main road or footpath to provide other farmers and residents of the area maximum visibility.

Each officer was requested to plan and supervise two demonstrations per season per year. Once the land was plowed or hoed, the extension officer who supervised that particular demonstration, arrived with the necessary inputs (fertilizers, seed, measuring devise, seed treatment, etc.) and worked with the farmer planting the demonstration. It was hoped that the

farmers and their neighbors would provide the labor, but this was not necessarily the case. It was also anticipated that a number of neighboring farmers could be assembled to observe and discuss the project with the extension officer.

The actual demonstration site was divided into three equal parts. The extension officer was to explain and supervise the planting of two of the plots. One would demonstrate a high degree of required inputs, as well as labor for subsequent operations. The second demonstration involved a slightly modified version of the first requiring less input and labor. The third was to be planted by the farmer using his traditional practices.

During the course of the season the extension officer was to observe and visit the demonstration and the farmer at regular intervals and supervise additional operations (weeding, side dressing) at the recommended times. It was hoped that at the time of these visits a number of farmers would become involved in the growth and culture of the demonstration plots.

Finally, at harvest the agent would organize a field day for the farmers of that town or village. The farmers would have the demonstration explained to them and then would participate in the harvest. At this time the crops would be harvested, weighed or piled, and examined to illustrate the different production regimes. In addition, discussion was encouraged to help illustrate the economic differences between the levels of inputs and expected returns.

The farmer was given all the produce from the demonstration and was encouraged and instructed to save the seed (an improved variety) for use in the next season or year. This procedure was highly recommended in cases where the farmers had sufficient amounts of fertilizer for the next season because the improved variety responds to fertilizer much better than does the traditional seed.

The agents were asked to report progress and problems associated with the demonstrations on a regular basis, and were also encouraged to invite the specialist and the district officer to the field days. It was felt that interest and participation on the part of the supervisors would inspire the farmers and the field officers.

D. Demonstration Programs

1. 1981

The 1981 demonstration program was successful considering this was a time of experimentation and training in terms of establishing the program. Performance and capabilities of the extension staff, as well as the reaction to and acceptance of the programs by the farmers, was evaluated.

As was expected, a number of problems with supply and input acquisition, along with acceptance and maintenance of the demonstrations by the extension officers and farmers were encountered. These problems served to strengthen the understanding of the specialist and the field officers, so that the program could be made more beneficial in ensuing years.

A summary of major and minor season plantings are presented in Table 1.

a. Farmer Reaction. In general the farmers' reaction to the MIDAS Extension/Demonstration program was quite favorable. Most farmers were enthusiastic over the technologies being introduced; however, it is difficult to determine how many actually adopted the production packages.

It must be noted that while the farmers were eager to participate in the program, most were not very willing to take part in the management of the demonstrations. It is also apparent that technologies involving inputs in short supply (fertilizers, improved seeds, agro-chemicals) or those requiring an additional investment (weeding operations, proper seed, and fertilizer placement) will be difficult to secure in Ghana presently.

b. Constraints. A number of constraints contributed to the less than 100 percent performance/success of the demonstration program. It must be realized that a number of these are present in a sophisticated farming situation and are the same problems faced by farmers throughout the world. It may help to clarify the problems that are felt to be most important.

We are dealing here with the physical constraints and not with any problems that may have occurred due to human interaction or lack thereof.

(1) Weather. While erratic rainfall patterns are considered typical of West Africa, it was felt by most farmers that the pattern of rainfall last year was clearly deviant from the expected norm. During the tasseling and seed filling stages, in both the major and minor seasons, there was a moisture deficit for up to six weeks, which caused a considerable loss of production in both the demonstration and commercial fields.

(2) Inputs. Many of the farmers who participated in the major season demonstration program anticipated the adoption of some or all of the suggested practices during the ensuing minor season. However, a number of the inputs recommended, notably fertilizers, were unavailable or only available in limited quantities at exorbitant prices. The supply of sulfate of ammonia ran out and none was available during the minor season for side-dressing the demonstrations or the farmers' fields. This was probably the most common complaint heard by the extension field staff.

TABLE 1. SUMMARY OF PLANTINGS - 1981 MAJOR AND MINOR SEASONS
BRONG-AHAFO REGION - LISTED BY DISTRICT

| Crop | | Planted | Harvested | Rejected |
|---------------------|--------------|---------|-----------|----------|
| <u>MAJOR SEASON</u> | | | | |
| <u>Atebubu</u> | | | | |
| | Maize | 24 | 13 | 8 |
| | Yellow Maize | 4 | 4 | 0 |
| | Groundnut | 8 | 7 | 1 |
| | Cowpeas | 1 | 1 | 0 |
| | TOTAL | 34 | 25 | 9 |
| <u>Nkoranza</u> | | | | |
| | Maize | 8 | 6 | 2 |
| <u>MINOR SEASON</u> | | | | |
| <u>Atebubu</u> | | | | |
| | Maize | 33 | 17 | 16 |
| | Yellow Maize | 2 | 1 | 1 |
| | Groundnut | 6 | 6 | 0 |
| | Cowpeas | 5 | 3 | 2 |
| | TOTAL | 46 | 27 | 19 |
| <u>Nkoranza</u> | | | | |
| | Maize | 7 | Unknown | Unknown |
| Berekum | Maize | 5 | 0 | 5 |
| Dormaa-Ahenkro | Maize | 4 | 3 | 1 |
| Goaso | Maize | 3 | 1 | 2 |
| Kintampo | Maize | 5 | 2 | 3 |
| Sunyani | Maize | 3 | 3 | 0 |
| Techiman | Maize | 5 | 0 | 5 |
| Wenchi | Maize | 6 | 3 | 3 |
| TOTAL | | 31 | 12 | 19 |

SOURCE: Experience, Incorporated compilations
4078A

(3) Tractor Services. The lack of tractor services and the cost of both the tractor and the fuel prevented a number of farmers, who would have participated in the program, from getting their fields plowed in time. In some cases the farmers were not able to get their fields plowed at all during either one or both seasons.

(4) Human Labor. Historically, manpower accounted for much of the small farm labor and has become increasingly expensive and difficult to manage. This proved to be an obstacle to the program in terms of land clearing, field preparation, planting, and cultivation of the demonstration plots and farmers' fields.

(5) Seed Quality. Some of the seed received for the demonstrations and sold to the farmers by The Ghana Seed Company was of extremely low germination causing a number of farmers' fields and demonstration plots to be abandoned.

(6) Animal Damage. Sheep and goats are allowed free range in and around many of the villages; therefore, those plots located close to settlement are in danger of being destroyed. In reality, a number of demonstration plots and farmers' fields were seriously damaged or destroyed by the animals.

(7) Transportation. The extension staff does not have any means of transportation. This is making travel to the office for meetings and supplies, as well as travel to outlying farming areas, increasingly difficult. In addition, staff are not adequately reimbursed by the Department of Agriculture for the exorbitant travel expenses that are incurred.

(8) Communication. The only means of communicating with the field staff is by letter or traveling by whatever means available to the District Office. Written reports or supply requests have not been as frequent or thorough as anticipated. This lack of information has made it difficult to keep accurate records and/or anticipate and solve problems.

2. 1982

As a result of a successful 1981 season and participation and communication with the Canadian International Development Agency (CIDA)/CRI Grain Development Project, the 1982 demonstration programs were slightly modified to coincide with national recommendations (targeting maize production in particular) that had arisen out of three years of research.

The format of the demonstrations was the same; but a number of the demonstrations and their materials were designed and distributed by the Grains Development staff. Because of this, demonstrations involved more thorough reporting procedures and included a "recipe" book to be followed for each demonstration.

These demonstrations were designed to serve as farmer demonstrations and for the collection of data to verify the Grains Development Projects proposed production packages. Hence, they were called Verification/Demonstrations (VD).

The VD's were supplied to each of the 16 districts in the region with an additional two for each sub-district in Atebubu District (16) for a total of 32 in the 1982 major season. Because of weather problems, not all of the demonstrations were planted (particularly in the Atebubu District) and some will be carried over to the 1982 minor season. An additional 16 will be distributed to 8 districts for the minor season.

An important feature of the 1982 major season has been a greatly increased regional demonstration program. In addition, the Regional Agriculture Officer has demonstrated considerably more interest and leadership in 1982 than what had previously been experienced.

A summary of 1982 major season plantings are shown in Table 2.

TABLE 2. SUMMARY OF PLANTINGS - 1982 MAJOR SEASON

| District | VD | Others | Total (All crops) |
|----------------|----------|------------------------|-------------------|
| Atebubu | 5 | 5 Maize 2 Groundnut | 12 |
| Berekum | 2 | 11 Maize | 13 |
| Dormaa-Ahenkro | 2 | 6 Maize | 8 |
| Goaso | 2 | 7 Maize | 9 |
| Kintampo | 2 | 8 Maize | 10 |
| Nkoranza | 2 | 9 Maize | 11 |
| Sunyani | 2 | 10 Maize | 12 |
| Techiman | 2 | 12 Maize | 14 |
| Wenchi | <u>2</u> | -- a/ | <u>2</u> a/ |
| TOTALS | 21 | 70 | 91 |

a/ Information on number of demonstrations in Wenchi District was not received before this report was prepared.

SOURCE: Experience, Incorporated compilations

4078A

a. Summary of Planting - Minor Season. At the time of this writing most of the planting is underway. It was noted during the last senior staff meeting that the minor season planting pattern would follow that of the major season, thereby adding 100 demonstrations throughout the Brong-Ahafo Region including 16 to 30 VD's.

Table 3 shows proposed plantings for the 1982 minor season in the Atebubu District.

TABLE 3. PROPOSED PLANTINGS - 1982 MINOR SEASON

| Proposed Planting | VD | Other | Total |
|-------------------|--------|--------------------------------------|--|
| Atebubu District | 11 | 15 Maize 8 Cowpeas 8 Groundnut | 42 proposed of which 9 had been confirmed as planted. |
| Other Districts | 2 each | a/ | a/ |
| TOTALS (Expected) | 27 | 96 | 123 |

a/ Similar to the major season if Regional Agricultural Officer can distribute the materials in time.

SOURCE: Experience, Incorporated compilations
4078A

b. Farmer Reaction. As in 1981, the general reactions of the farmers to the program have been enthusiastic and very responsive. However, fertilizer is not as accessible to the farmers as it was the previous year. This is one of the most important tenents under which the program is operating and very necessary to allow the improved seed to perform to its potential.

The farmers in Atebubu District, and (as indicated by district officers) some other districts have been enthusiastically purchasing improved seed from The Ghana Seed Company. This year The Ghana Seed Company has had much more seed of good quality available, and has been able to make good distribution of it geographically.

c. Constraints. Many of the constraints discussed for 1981 also apply to the 1982 major season. None, with the exception of the availability and quality of seed, have been noticeably improved.

One factor that has led to an improved program is an enthusiastic performance and increased understanding of the program by the extension staff. This alleviated some of the problems in providing for and supervising tractor services, placement of demonstrations in areas where animal damage may occur, communication, and reporting.

In Atebubu, Kintampo, and parts of Wenchi Districts a severe drought at the time of planting the major season severely restricted the number of demonstrations. As a result, by extension service estimates the normal farm production will be reduced 50 percent or more. Thus far, the 1982 minor season had adequate amounts of rainfall to allow for planting, thereby encouraging farmers to increase acreage and make up for a poor major season.

E. Training

It was planned that a series of annual or bi-annual training sessions for the regional extension staff be organized and that a training officer be stationed in Sunyani, who could coordinate and supervise these and other training programs during and after the specialist's tenure. This situation did not materialize. Instead, the following methods of training were utilized:

- o A Regional Training Session at Wenchi Farm Institute - January 1981;
- o Regular meetings with regional and district staff;
- o Preparation of Crop Production Guides and other extension materials;
- o Field trips and site visits by extension specialists and research officers.

A regional training session was attended by the field officers of the Brong-Ahafo Department of Agriculture. This meeting offered a formal opportunity to briefly explain and discuss the MIDAS Project, allowed presentations by some key MIDAS project consultants and administrators, and outlined the long-term designs of the project and its components. The purpose of the meeting was to introduce the officers to the MIDAS Project as well as provide specific information of a technical nature.

Training and discussion sessions were held on a regular basis with the regional senior extension staff at Sunyani and with the Atebubu District staff at Atebubu. During these sessions new ideas and formats were introduced, practice sessions involving demonstration layout and maintenance were held, and

field trips (if transportation was available) were made to farmers' fields and to the MIDAS Small Farm's Systems Research site. This was a very useful exercise for the specialist and the extension staff.

The specialist, in cooperation with the Atebubu District staff, prepared and disseminated various crop production guides, reporting guides, formats for reporting field activities and other items. These were prepared and distributed as time and material permitted. The field officers, who did not have access to new extension material for several years, were quite receptive to this effort. Most of the materials were produced in collaboration with, and utilizing the findings of, the Grains Development Project, the Grain Development Board, and the MIDAS Small Farms Research team.

As always, in-field visits from the specialist and the district officer provided incentive and opportunities for the field officers to discuss problems and solutions or seek advice and assistance. Effort has been made to work closely with the field officers in laying-out and maintaining the demonstrations.

Three District Officers were sent to the United States under the Participant Training Program as part of the MIDAS Project Extension/Demonstration Component. They received three months of training in extension program planning at the University of Georgia and were able to observe extension agents in the field. Two additional participants were nominated but were unable to attend due to travel restrictions imposed by the Government of Ghana (GOG).

F. Program Planning

1. Personnel

The MIDAS Project Paper called for placement of two people with a Technical Officer rank or higher and at least four technical assistants in each sub-district, starting with the target districts and eventually upgrading the staffing of the entire region. This has not occurred. The number of officers in the Brong-Ahafo Region has increased due to placement and subsequent promotion of diploma candidates (Third Year Learners) from the agricultural colleges.

2. Training

As noted previously, there were plans to organize regional training sessions on a regular basis. These plans never materialized.

During the latter part of 1981 and the first half of 1982, a considerable effort was made to devise a syllabus, and hold a training session in conjunction with the MIDAS/Agricultural Development Bank (ADB) Small Farmer Credit component. To date the working group convened on three occasions, and submitted a draft of the syllabus to the ADB for approval and typing. Additional details can be found in the 1981 Annual Report.

It does not appear that this training session will materialize before the expiration of the specialist's contract, but may do so under the auspices of the Department of Agriculture and the ADB.

3. Budgets

There has never been a formal budget for the extension/demonstration component. Efforts were made during the course of the consultant's work to submit sample budgets to the Regional Agriculture Officer for approval. The officer included an adequate estimated budget for justification in the 1982-83 budget hearings that should have been held in Accra in June. Due to the current situation with the GOG, all budgets have been frozen until the end of 1982. Therefore, any expenditure and efforts will have to be made through the regional office.

It must be noted that, while the specialist had no budget to work with, he did make specific requests, and submit receipts to the Regional Officer, who was able to allocate funds from other areas to cover those expenses. This was, however, a cumbersome procedure as the specialist's working base was in Atebubu, and approval and allocation of funds had to be made from Sunyani.

4. Inputs and Extension Materials

The original project paper called for distribution of extension materials and tools to the field officers, along with motorcycles and bicycles. Additionally, the MOA and the MIDAS project were to provide locally available inputs such as fertilizer, paper, duplicating materials. Only a few items, however, (sprayers, scales) were ordered and received from the United States and distributed to the officers at the time of the initiation of the program. There were only enough of these items for the Atebubu District, with a small number of tape measures and scales left over for the other eight districts.

The specialist worked with the USAID Project Manager to secure an immediate order for the remainder of the required extension materials for the regional program, particularly the motorcycles and bicycles.

The period of time it took to acquire these items was in keeping with standard government procurement practices and resulted in a delay of over a year. In some cases, materials were ordered in insufficient quantities. No effort was made to place future orders on a regular basis so that as the project expanded the materials necessary to place and maintain the trials would be on hand.

All the materials ordered during 1981 arrived in the country; however, already midway into the 1982 season the items are still at the MIDAS Project Offices in Accra. The specialist has repeatedly requested the Project Manager to have these items distributed to the officers.

The bicycles which are badly needed were never ordered due to problems with waivers, and motorcycles not being licensed or distributed in Accra.

Local procurement of paper and other materials was less than adequate for production of extension materials, and preparation of regular and timely reports by the field staff.

5. Regional Planning Committee (RPC)

The MIDAS Project called for both national and regional steering committees which were to advise and coordinate the various components for delivery of the maximum amount of goods to the farmers and the other recipient groups. The regional committee was to be organized and chaired by the Regional Minister or, acting on his behalf, the Regional Agricultural Coordinator. It was to meet on a regular basis to keep the entire project moving on the proper course.

Whether or not this concept was understood, or whether leadership was lacking, the plan never materialized. Instead, several ad hoc meetings with concerned parties were held in Sunyani, but dealt solely with specific problems. Otherwise, the RPC convened only at special request of the MIDAS Project Manager.

Had this proposed group been organized and functioning, many of the problems concerning coordination of the various components, allocation of funds, and materials, as well as better coordination and distribution of the MIDAS commodities could have been alleviated. The group could also have provided the continuity necessary between USAID and the GOG upon the termination of USAID's involvement.

III. LIAISON ACTIVITIES

Part of the duties of the extension specialist has been to serve as a liaison officer between the various components, and with both American and Ghanaian government institutions. In this way, the Extension Component could bring the best possible new information on cropping, storage, credit and other farm-related practices through the field officer to the extension staff and then to the farmer. These liaison activities also served to keep the specialist abreast of other policy and administrative problems.

A. Brong-Ahafo Ministry of Agriculture

Throughout his tenure, the specialist traveled to Sunyani to attend the monthly meetings of the senior staff of the Department of Agriculture. During these meetings and the ensuing stay in Sunyani the specialist became acquainted with and discussed the problems of the district officers as well as met with the counterpart, Mr. J.K. Tawiah (RAO) to plan and discuss the MOA's extension activities. In addition, these trips also served as an opportunity to meet with the Regional Agriculture Coordinator, Mr. B.K. Owusu.

The meetings were a very useful forum for discussing and planning extension activities, as well as for allowing an opportunity for the specialist to learn and work with the problems of the extension field staff and administration.

The first year of these meetings was quite disappointing in terms of the lack of support for and understanding of the project by the regional and district officers. However, in 1982, the support, organization and enthusiasm for the project was most encouraging. As can be seen from the summaries of planting for the demonstrations (Tables 1, 2, and 3), the regional response has improved considerably--particularly at a time when requisite inputs have been even more scarce.

If this project is to continue after the departure of the specialist and with consideration to impending cutbacks in the project by USAID, the regional and district staff will have to realize the usefulness of the project, arrange for timely acquisition and dissemination of the necessary inputs, and keep in contact with the national maize improvement project at Crops Research Institute for the latest production packages.

B. MIDAS Project Manager

The specialist attempted to meet and communicate with the MIDAS Project Manager on a regular basis to keep him informed of the field extension activities and to bring to his attention problems that his office is responsible for resolving. In most cases these issues have been handled in a satisfactory manner; however, difficulties in communication with the MIDAS Project Office has led to delays and misunderstandings.

It is felt that the proper administrative management of the extension demonstration component is lacking. The initiation of the Regional Planning Committee, the ordering and acquisition of extension tools and transportation, and the establishment of a working budget prior to the specialist's arrival should have been coordinated from the project manager's office.

C. USAID

Throughout the course of the contract the specialist has been acting as the liaison officer between USAID and the various MIDAS components and consultants located in Atebubu. Frequent communication has been maintained to keep USAID informed and to make requests regarding the extension component, the small farms research team, the MIDAS Commodity Distribution Scheme, the District Planning and Rural Development (DIPRUD) and Association of People for Practical Life Education (APPLE) projects, and the management and maintenance of the USAID Residence Compound.

These activities required making numerous reports, payroll supervision, fuel ordering and records keeping, personnel supervision, vehicle maintenance, as well as inventory and warehouse supervision and control. Also involved was supervision of various construction projects, notably the compound warehouse vehicle repair and residence complex, several DIPRUD buildings, and placement of the fuel tank in the ground.

Regular contact was made with the following individuals over the course of the project.

| | |
|--------------------|---|
| Dr. Oleen Hess | - ADO (retired) |
| Mr. Stephen Szadek | - ADO (transferred) |
| Mr. Jerry Rann | - Atebubu Compound Manager and DIPRUD Project Manager (transferred) |
| Mr. Frank Mertens | - Extension/Demonstration Project Manager (transferred) |
| Mr. John Thomas | - Atebubu Compound Manager, DIPRUD, and Farmer Associations and Agribusiness Development (FAAD) Project Manager |
| Mr. Gerald Zarr | - Mission Director (transferred) |
| Mr. Larry Saiers | - Acting Mission Director |
| Mr. William Flynn | - Project Manager (Acting ADO) |

It was felt that during the time of the contract excellent reciprocal communication existed.

D. MIDAS Small Farms Systems Research Component

Throughout the duration of the specialist's assignment, the International Institute for Tropical Agriculture (IITA)/MIDAS Research Team consisting of Dr. V. Balasubramanian, Soil Scientist and Team Leader and Dr. J.O. Braide, Agronomist, have been in residence at the Atebubu compound. They have been working to establish a small farms research farm in the Atebubu vicinity and train local staff to proceed with the experimentation program upon termination of their contracts.

While the team has not been able to extract much data after less than two years, the demonstration program has been modified to incorporate their basic premises (in keeping with research findings from IITA), and to make sure their information will be incorporated into the extension suggestions.

Continued cooperation with the IITA team will be maintained throughout the remainder of the 1982 season. Though the small farms research team is still awaiting analysis of their research findings, and have been unable to publish tested improved crop production information, they approve of the extension packages being recommended.

E. The Ghana Seed Company

The Ghana Seed Company initiated sales in Atebubu during 1981 through a private agent. The seed was of mixed quality and sales met with some success, but was generally felt to be too expensive. The problems were reported to the Seed Company administration and to one of the consultants.

During the latter part of the year a kiosk was built to serve as the sales location for The Ghana Seed Company in 1982. A salesperson was assigned, an inventory established, and sales initiated during the major season of 1982. Due to adverse weather conditions, maize was not planted in abundance and sales were moderate. Vegetable seed, however, continued to be popular.

The 1982 minor season resulted in the greatest seed sales yet which were brisk and of high quality, causing the stocks to be replenished on several occasions.

The extension specialist provided production guides (identical to those given to the extension staff) to be posted in the kiosk for reference by the sales personnel and general public.

F. ADB/MIDAS Small Farmer Credit Component

During the past two years the principals of the extension and the credit components met to discuss the cooperative farmer training and credit programs. The ADB was to provide the name and locations of their loan scheme groups, and the extension staff was to help these groups maximize their production through introduction of improved technologies and other extension-related services. In subsequent years they were also to help in screening farmer groups for the ADB in order to provide loans to the most diligent and capable farmers.

Additionally, a formal training program was to be set up jointly with the ADB and Extension. A syllabus was prepared covering two main topics: "Improved Crop Production Methods" and "Principles of Supervised Credit". This syllabus is to be used to train the extension field staff and the ADB, and then be given to these participants as a field guide for in-field seminars and training sessions for the Loans Scheme Executives. Unfortunately, approval by the ADB is still awaited before the formal training can begin.

G. MIDAS Commodity Distribution

It was envisioned, as a result of the MIDAS agreement, that the USAID would import commodities every year for small farmers and support groups (blacksmiths, fishermen, etc.). These commodities would be sold in target areas to individuals and groups that were certified or identified as small farmers, fishermen, etc., in quantities for personal use.

The funds generated from the sales of these commodities would be administered by the ADB in cooperation with the Bank of Ghana and used for the Small Farm Credit Scheme. As a result, the amount of funds available for loans would increase every year.

Commodities began arriving in Atebubu during the spring of 1981 but sales did not commence until the fall. The entire procedure for allocation and sales was cumbersome, and placed the majority of the responsibility for allocation and distribution on the Atebubu District Agriculture Officer and his staff.

The sales continued slowly during the initial months and were marked by the absence from post of the MIDAS accounts clerk and bookkeeper, for half-month periods. Sales could not take place and prices were not determined on a number of items. There were no spare parts for some of the engines and other items.

However, most of the commodities eventually got to their target groups in the Atebubu District as planned. Until the Bureau of Integrated Rural Development (BIRD) team carries out and completes monitoring the exercise, it will be difficult to judge its impact except by verbal reports from the extension staff.

Sales concluded in June, when the remaining commodities were turned over to United Africa Company (UAC) Ghana Ltd., for distribution through their existing sales locations.

H. Agricultural Research and Academic Institutions

At the outset of his work in Ghana, the extension specialist made contact with all the institutions listed below in order to collect any available extension materials, to become acquainted with the leaders in the field, and to attempt to establish links for the continued success of the project during and after his tenure.

1. University of Ghana, Legon/Accra - Department of Agricultural Extension

The Department of Agricultural Extension, and particularly Mr. Felix Fiagbe, have been helpful in sharing what few extension materials they had and in providing briefings on the present state of the system. They were also instrumental in developing some of the materials that were used in Atebubu.

2. University of Science and Technology, Kumasi

Dean J.C. Norman of the School of Agriculture was helpful in providing materials and publications on vegetable production and in commenting on how he felt the project should be approached.

3. Grains Development Board, Kumasi

The Grains Development Board has been working with the CRI/CIDA Grains Development Project, because part of what applies to the CIDA Project also applied to them. The director of research, Mr. Kwampah, has been most generous in providing extension publications, seed, and production guides for all the field crops commonly grown in Ghana.

4. Crops Research Institute/Canadian International Development Agency Grains Development Project, Kwadaso/Kumasi

The specialist has worked closely with the expatriate co-director of the project, Dr. G.O. Edmeades. Major changes in the demonstration and general cropping packages were suggested by Dr. Edmeades and his research colleagues.

The Grains Development Project has provided seed for both our demonstrations and for use by the commercial farmers. They have also provided all the materials, some supervision, and all the inputs for the Verification/Demonstrations.

Additionally, the project organizes a national Maize Workshop every year to bring together all the various maize workers in the country and as many of the field staff as can be accommodated. The specialist was invited to present a paper on Maize Demonstrations under MIDAS on February 23-25, 1982, at Kwadaso Agricultural College. The specialist has also recently been working with the staff to prepare a major maize production bulletin.

IV. HOME EXTENSION UNIT

During 1981, the Home Extension Unit began its program in the Brong-Ahafo Region. Atebubu District was the first district selected, and a District Officer, Miss Georgina Opoku, was posted there. Subsequently, a Technical Officer and several assistants were also added to the staff.

Miss Opoku was then transferred to Sunyani District to act as District Officer and to liaise with the Regional Agricultural Coordinator and Regional Agricultural Officers. Miss Comfort Agbozo was assigned as District Officer for Atebubu.

The specialist worked with the district offices on various types of logistical support problems and provided advice in dealing with staff problems. He also worked closely with the officers in developing their rabbit project, particularly in the design and construction of rabbitries to be used as examples for the villages and in developing a central location for building breeding stock.

The actual program in the region has been developing slowly. Both officers had difficulty training and controlling their staff, and more importantly, dealing with lack of transportation and fuel.

Plans called for the Home Extension Unit reaching at least 11 villages with food and nutrition programs, food production and backyard gardening, home and sanitation management, and small animal husbandry including production and utilization of rabbits. None of these were accomplished.

Though the site for the Home Extension/Demonstration House was selected, approved and purchased in 1981, no further progress was made on it because of the difficulty in obtaining raw materials.

V. USAID COMPOUND AND DIPRUD ACTIVITIES

During the entire time the specialist was in Atebubu, he, in cooperation with USAID, supervised and maintained the USAID residence compound at Atebubu. The duties included: supervision of staff, both contractual and day labor; compound maintenance, supervision of fuel supplies and records keeping; communication with USAID in Accra to relate problems with compound maintenance, the MIDAS extension component, the research component, the DIPRUD project, and at various times the progress of APPLE; assistance with the arrival and accommodation of visitors at one of the guest facilities; and general supervision of all the USAID projects in the area.

During the tour of duty construction was completed on a warehouse/fitters shop/residence complex on the compound. In addition, three Caterpillar 52 kva generators, underground wiring, and a 3,000 gallon petrol tank with electric pump were installed. The compound is presently nearing completion. The only two projects that remain to be done include the grading and graveling of the road system, and the hiring and outfitting of a qualified full-time mechanic.

Contract staff consisted of three people, two of whom are residents on the compound. Day labors and artisans were also employed and did the bulk of the building for the DIPRUD and MIDAS Project. At times, the day crew numbered ten or more individuals.

The most pressing recurring problems include:

- o Timely delivery of fuel for the generation of electricity;
- o Vehicle maintenance without a fitter or proximity to spare parts in Accra;
- o Inadequate pumps and water delivery system, which caused a shortage of water most of March, 1982. (New pumps had to be ordered through Experience, Incorporated, and it was noted they were not a standard item and had to be custom built and delivered); and
- o Acquisition and delivery of building supplies, notably cement, nails and paint. Eventually everything was delivered, but the delay increased the cost of building, caused some of the projects to take too much time to complete, and required a considerable amount of the specialist's time.

A. District Planning and Rural
Development (DIPRUD) Activities

The specialist arrived in Atebubu in September, 1980. At that time he was introduced to the person who was just completing a personal services contract as an up-country project officer for the DIPRUD Project and Compound Manager. Several sub-projects were begun that still required constant monitoring. Upon traveling to Accra, it was mentioned that the specialist would assist in the capacity of project officer as well, and over the course of the contract, participated fully in providing guidance, maintenance, and supervision of the following DIPRUD sub-projects:

1. The Zongo Community Health Shed - Completed 4/81
2. The Akokua Gari Factory - Completed 6/81
3. The Atebubu Adinkra Dyemakers Cooperative - Completed 9/82
4. The Atebubu Poultry Association Grinding Mill Project - Completed 3/82
5. The Atebubu Lighting Project - Completed 3/82
6. The Kyerepo Youth Fishing Association - 80 percent complete. All materials allocated.
7. The Abease Community Center - Still under construction. Completion is doubtful.
8. The Mim Health Clinic - Will be completed 9/82

DIPRUD activities will terminate on September 31, 1982.

VI. CONCLUSIONS AND RECOMMENDATIONS

The initial phase of the MIDAS Extension/Demonstration component can be considered successful. The objective of initiating a crop demonstration program to upgrade the effectiveness of the extension service and introduce farmers to improved production systems for basic food crops was accomplished. Some progress was made in improving the extension officers' attitudes toward the project and the performance of their duties.

In general, the long-term success and promotion of the demonstration program and the extension service will be very difficult to sustain. While the farmers would like to adopt some of the improved practices, there are no inputs available. The extension staff would like to travel and promote the latest in extension ideas, however, there is neither financial nor program support.

Additionally, the farmers' increases in production will improve their standard of living only if there is a marketing and trading environment that will provide incentives for increased production. If they grow more and cannot command a price at the market place that they deem fair, there will be no desire to produce more than a family can consume. If they are not able to buy those commodities for which the crop has been produced and sold, there will be no incentive to increase production. If produce is not able to be moved to the market because of prohibitive transportation costs the farmers will not increase crop production.

The officers of the extension service need incentives as well. It can only be counterproductive when they are given the latest information on crop production but have no transportation available with which to distribute it. If the new production packages involve scarce or unavailable inputs, the agents will not be able to demonstrate the procedures or provide the farmers with useful information. If there is no effective leadership, program planning, or support, they will be unable to provide information to the farmers in a coherent fashion. Moreover, if they are neither paid a livable wage nor adequately supervised, they are not likely to work. The extension officers are badly in need of materials for use in establishing and maintaining demonstrations, paper for preparing reports, and notebooks to keep records of field trips.

The overriding problems with the extension services are the same problems that face most institutions. Personnel are overlooked and underpaid, and the organization is not supported by the Department of Agriculture. One basic problem within the Department is the lack of a distinct and organized program for which the specialist was to provide advice and training.

If this project was to be continued, the emphasis of the extension phase would have to be redirected. Current problems involving the extension officers can be solved with technical advice and added inputs--which is the present approach being undertaken. There are, however, four areas which would have to be emphasized in the design of a new development program for the extension service in Ghana. They include:

1. Reorganization of the Department of Agriculture;
2. Economic and material support;
3. Communication and transportation improvements; and
4. Infrastructural development

The Department of Agriculture is designed to be a decentralized department of the Ministry of Agriculture. This implies that the regions control their particular programs more closely than does the national office located in Accra. In theory, this organization should be reflected in a degree of autonomy at the district level as well. In reality, however, the district programs, budgets, inputs and salaries are dependent on, and tightly controlled by, the regional office. The district receives little feedback or cooperation, and budgets and programs seem to be arbitrary and personally biased in favor of the Regional Officer. This situation seems to be true also for the regional programs, and is especially apparent in areas pertaining to inputs, vehicles (including bicycle allocations), expenses, and budgets. Most often cooperation exists as a result of personal favors.

The Department of Agriculture would benefit immensely from reorganization. National, regional, and district program planning should take place on a regular basis, with some guidelines, support and participation from each member of the hierarchy. Meetings should be held regularly at all levels to discuss and find solutions to problems. Members of the research institutions should be called on to work closely with the Ministry to develop training programs as well as bulletins with the latest available material and information. Job descriptions should be prepared and individuals held responsible for performance of their duties.

Auxillary problems exist that must be corrected concurrently with redesigning most aspects of the program. These issues must be discussed with the central government in order to support the area of the government having the most direct influence on production of food and raw materials. A successful and progressive farm environment would encourage productivity in most other components of society.

Areas yet of concern include: economic and material support, transportation, communications, infrastructural development, and road building and maintenance. The more the officers

are expected to do, the more they must be supported in terms of improved communication, (wireless radios, paper, stencils, notebooks, and pens and pencils). They are not likely to use their superiors as an extension resource if communication becomes a struggle such as knowing that a letter may never reach its destination or that if it does, a prompt and conscientious reply may not be made. By the same token, the Department of Agriculture is very remiss in support of the field staff for travel reimbursement; nor do they provide adequate allocations of motorcycles or bicycles from the government.

Everyone advocates agricultural development, but at the same time little is done to follow through. Closely related to all the problems of the extension service is the current lack of infrastructural development. Most government organizations suffer from the same lack of support and materials as the extension service. Therefore, an improvement in services and infrastructure would further improve the performance capabilities of the extension service. The most problematic areas include those of roads, domestic water supply, health care, and communication.

If the extension service is to be a functional government organization and provide the large and small farmers with a positive, up-to-date extension service, the Department of Agriculture needs to upgrade its organizational structure. National, regional, and district programs must be redesigned, approved, and continually supported. Both physical and educational materials must be provided and updated regularly so the farmers are better able to utilize the new information. Furthermore, the farmers and the extension agents must be supported through the supply of tools, inputs, transportation and the communication necessary to form a cooperative and productive unit.

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FINAL REPORT - JULY 1981

John I. Sutherland
Technical Director - Ghana Seed Company Limited

A. Introduction

This Consultant was employed August 20, 1979, for a two year contract to work in Ghana as Co-Managing Director of the Ghana Seed Company Limited. The Ghana Seed Company Limited was organized in August of 1979 as a parastatal organization to be capitalized by 60 percent stock purchased by the Government, and 40 percent to be available for purchase by other investors. Currently the Government of Ghana is the only stock holder whose contribution as of June 30, 1981 was 20 million cedis.

This national Company was established to implement a Government and USAID seed multiplication program to economically produce, process and distribute seed of improved varieties for sale to Ghana farmers.

To accomplish this charge, the government established the following goals in chartering the Company:

1. To acquire and take control over the operations, assets and liabilities of the Seed Multiplication Unit of the Ministry of Agriculture.
2. To establish and manage farms for the production and sale of seeds and planting materials to meet the requirements of modern agriculture in Ghana.
3. To enter into contracts with state-owned organizations, as well as interested seed growing and producing concerns, for the sale and purchase of seed and planting materials.
4. To distribute seed on a nationwide basis with special emphasis on making seed available to small scale farmers and home gardeners.
5. To operate processing and conditioned storage plants to meet the increased seed needs of Ghana.
6. To carry on research for the development of new varieties of seed and planting materials.
7. To sell food and feed as a by-product of the seed industry.

The personnel of the Company consist primarily of former employees of the Ministry of Agriculture erstwhile Seed Multiplication Unit. Some 933 employees of the Seed Multiplication Unit opted to join the Company and were assigned to either the headquarters office in Accra, or to the five area offices in Winneba, Ho, Kumasi, Tamale and Bolgatonga. The bulk of the employees are farm workers assigned to fourteen (14) farms through the country. At the end of 1981, the work force will have been reduced to 679 employees in order to more efficiently utilize the labor force.

An executive development program was implemented to develop company executives and managers through on-the-job training. Some basic features were:

1. Clearly define responsibilities
2. Delegate assignments
3. Allow freedom to make decisions
4. Arrange to acquire needed additional knowledge (Experience, Incorporated consultants)
5. Provide management training

In addition, the program was designed to encourage the expression of ideas, use of imagination, enthusiasm, ingenuity, judgment and decision making. The training has taken place under this consultant. Performance to date has been satisfactory, but more time is needed to complete the training program. This consultant estimates the program should be continued for at least another two years.

B. Consultant Job Duties

The primary assignments of this consultant were:

1. To develop and implement the overall organization (personnel, operations, management, administration) for the Ghana Seed Company, a parastatal corporation under the Ministry of Agriculture Managed Input and Agricultural Services (MIDAS)
2. To collaborate with and train the Ghanaian co-managing director in all aspects of operations. As the program progresses, the technician will place increasing responsibility for the program on the Ghanaian counterpart.
3. To coordinate the Production Section, Processing Section, Quality Control Section, and Sales and Distribution Section.

4. To organize and establish the business and fiscal procedures for the company and supervise its operation.
5. To represent the Seed Company at meetings with the Board of Directors who determine policy matter, decide upon pricing, and award contracts to growers.
6. To organize and supervise, through the General Manager, public relations and education.
7. To organize and supervise the Office of Research which has the responsibility for introducing and testing varieties, determining fertilizer recommendations, identifying superior cultural practices, promoting irrigation and developing methods of seed production.
8. To cooperate with the National Seed Committee, which is responsible for approval and authorization of new varieties.
9. To cooperate with the Ghana Inspection Service, an autonomous body, which regulates and controls the quality of seed marketed in Ghana.
10. To develop a training needs program and schedule to prepare the Seed Company staff for performing appropriate functions. This Consultant arrived in Ghana on November 5, 1979, after several weeks of delay in obtaining country clearance. The Acting Managing Director, Mr. J. Wobil was designated as a counterpart. The consultant's designation was "Technical Director" of the Company with a primary assignment to work with, and train the Acting Managing Director.

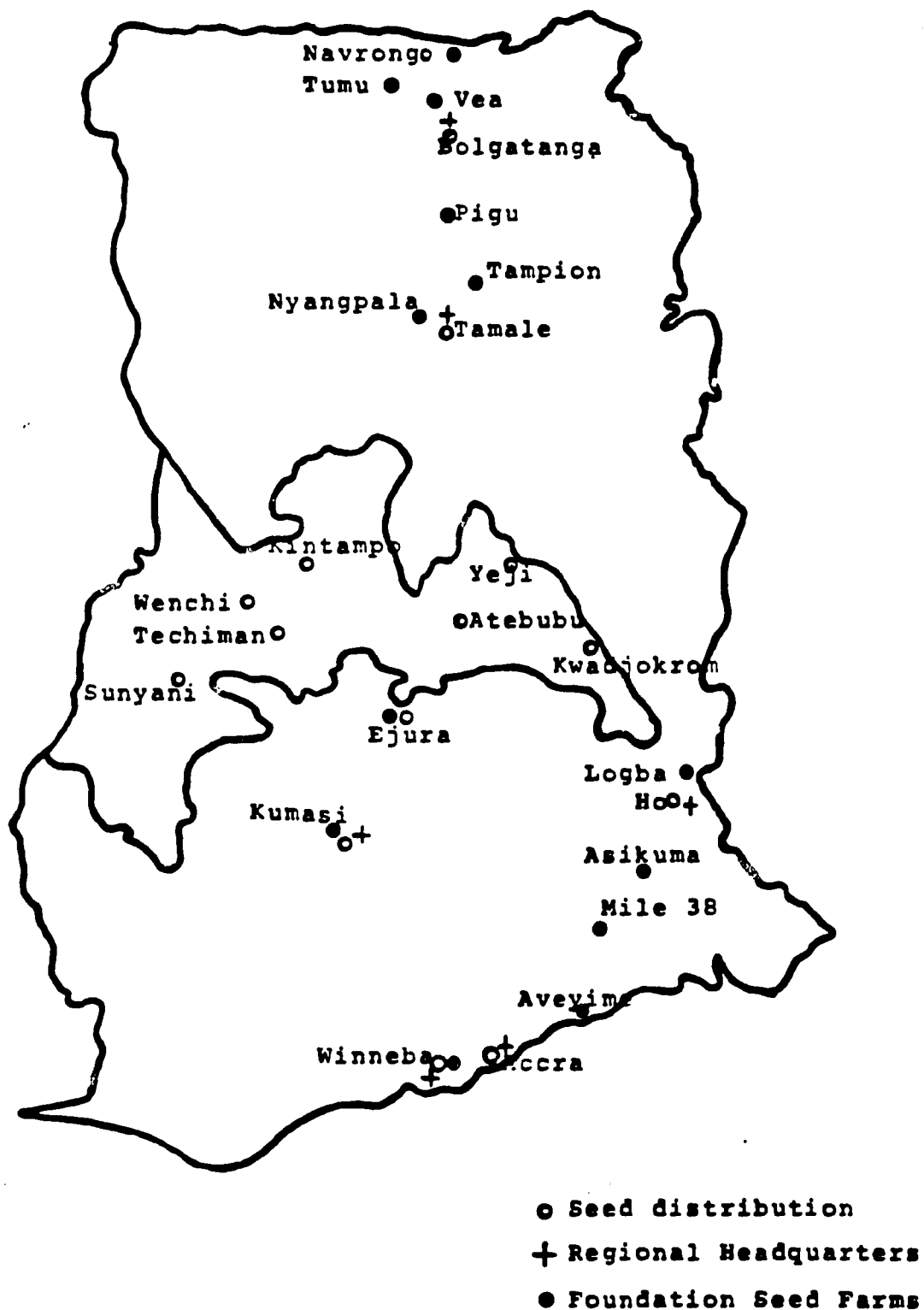
A map designating seed distribution outlets, regional offices and foundation seed farms in Figure 1.

C. Accomplishments

Accomplishments which can be readily identified are:

1. Inventory of assets and liabilities as of June 30, 1980.
2. A new accounting system.
3. A new inventory system.
4. Development of reports and reporting procedures for monthly sales and inventory.

FIGURE I. MAP OF GHANA INDICATING SEED DISTRIBUTION OUTLETS, REGIONAL OFFICES, AND FOUNDATION SEED FARMS



5. Programs to develop product identification and company image:
 - a. A logo
 - b. Newspaper, radio, TV and billboard advertisement.
 - c. Designed and printed letterhead, invoices, sales receipts and other administrative materials.
 - d. New seed labels to identify the product.
 - e. Identified all vehicles and property and a logo and company name.
6. Designed letterhead, forms and report.
7. Designed personnel application forms.
8. Designed personnel evaluation forms.
9. Senior staff service conditions were developed and approved by the Board of Directors
10. Revised the annual budget format and preparation procedure.
11. Strengthened management staff by hiring additional key personnel - research, processing, quality control, accounting, office administration and area offices.
12. Designed annual planning conference to develop budget and plan of work.
13. Special arrangement with local suppliers for inputs such as sacks and tires.
14. Prepared a growers contract for the registered seed growers program.
15. Set-up sales and distribution and an experimental marketing program.
 - a. Kiosks distribution system in key villages
 - b. Sales agents
 - c. Material retailer for regional sales
 - d. Van sales at market days in key villages
 - e. Agricultural offices
 - f. Direct sales from company stores

16. Developed a contract agreement for establishment of a sales agent program.
17. Job description prepared on all key personnel.
18. Located and moved into new headquarters office space.
19. Establish standard operating procedures for setting margins and prices.
20. Revised junior staff service conditions.
21. Developed strategy for negotiations of Junior Staff with T.U.C.
22. Increased inventory supplies of vegetable seed through expanded importation program.
23. Management training by on-the-job visitation to all company locations.
24. Management training and development for transition from a government agency to a private company.
25. Revised organizational charts and reporting responsibilities for key personnel.
26. Reduced farm labor personnel by some 300 employees.
27. Designed new tags and identification of company products.
28. A central purchasing system has been established.
29. A tally card inventory system has been updated.
30. A new central filing system has been set up.
31. Area managers and senior employee appointments have been confirmed.
32. The payroll is a direct funding of the company and no longer a function of the government.

Many other specific accomplishments could be mentioned in these highlights but the processing and production consultants will be reporting on these areas at a future date.

The overall organization of the company has been completed. Effective implementation and follow through on the many programs initiated these past two years will depend upon conditions of future management training and leadership programs.

D. Conclusions

The transition from a government agency to a private company is 75 percent complete. The company should be fully capitalized by additional government funding as of September, 1981. Once these funds have been transferred to the Ghana Seed Company the transition period will be over.

The slow but steady growth of the company since it became operational in August 1979 has been exceptional. This growth has been possible even with the general overall poor economic conditions throughout the country. The company is still in its embryonic stages, but it has been successful with its programs for producing, processing, marketing and distributing high quality improved seed to the farmers of Ghana. More could have been done, but delays in completing the construction of two new processing and storage facilities has slowed progress. This delay is only temporary since the Winneba plant will be operational in early 1982.

The company's promotional programs have helped alert the farmers, and home gardeners, on the availability of seed and the advisability of using improved seed varieties.

Several major problems must be dealt with if adequate seed supplies are to be made available to support an expanded agricultural production program and the growth of the company is to continue through 1982 and 1983:

1. Allocate resources to complete the Winneba and Kumasi Seed processing centers.
2. Establish a radio network between area offices--better communication will increase efficiency and permit sound operational decisions in a timely manner.
3. Furnish additional transport vehicles for personnel, inputs and seed.
4. Set-up a spare parts replacement program that can respond to the needs of the company.
5. Order on a more timely basis inputs and farm equipment.
6. Develop an input program that makes such things as tires, batteries, bags, fuel, ect., available to this time-sensitive business.

In addition to the physical inputs mentioned above, the management development and training programs should be continued. Management performance and accountability must be

further developed with special emphasis in the financial and accounting areas. The new, young manager needs more time to fully develop these skills.

E. Recommendations

1. USAID to continue the technical assistance to the Ghana Seed Company by furnishing three consultants - a processing consultant, a production consultant and a co-managing director consultant.
2. It is recommended the current Acting Managing Director be confirmed as Managing Director.
3. New vehicles and farm equipment as programmed under MIDAS II should be ordered as soon as possible.
4. A suggested 15 additional personnel carriers be purchased to enable management from headquarters and area office to visit farms, contract growers and all area in a more timely manner. Since communications are extremely poor, this function must be given a high priority of consideration.
5. The financial records of the company need continued improvement. The establishment of a new accounting system has caused some delay, but special emphasis must be given to:
 - a. Completing an inventory of all assets acquired by the company as of July 1, 1981.
 - b. A physical inventory must be completed on all goods and property of the company especially store items and carryover seeds.
 - c. Monthly financial reports must be prepared for management and the Board of Directors.
 - d. The preparation of the annual budget should have more inputs from area managers.
 - e. The company should audit its sale offices on a quarterly basis.
 - f. More timely annual audits.
6. Attention should be placed on completing the transfer of Government of Ghana 1981-82 funds to the company by September 1981. All efforts should be made to meet the deadline set forth in the MIDAS II agreement.

7. Study experimental sales projects and adopt new techniques where results justify. A combination of sales techniques such as - company-owned kiosks, area offices, van sales on market days and use of national retailer or sales agents appear to be most effective.
8. Continue to interview for qualified personnel to complete the management team.
9. Move headquarters office to a larger building with more space for new personnel, a laboratory, seed and stores storage and sales outlet.
10. Retain a private lawyer be to handle legal matters.
11. Place more emphasis on encouraging key employees to accept additional responsibility in their various job assignments.
12. Continue the executive development program for another two years.
13. Distribution needs additional vehicles and a reliable fuel supply.

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